USER GUIDE

Trimble Geo 5T handheld

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Trimble

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- Consult the dealer or an experienced radio/TV technicianfor help.
Changes and modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission rules.
The radios in this device have been designed and manufactured to not exceed stipulated emission limits for exposure to radio frequency (RF) energy as required by the Federal Communications Commission of the

U.S. Government 47 C.F.R. § 2.1091 and 2.1093. The external antenna connector provided in this device is for GNSS antennas only.

IC

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.
This Category II radio communication device complies with Industry Canada Standard RSS-310.
Ce dispositif de radiocommunication de catégorie II respecte la norme CNR-310 d'Industrie Canada.
IMPORTANT NOTE:
IC Radiation Exposure Statement
This EUT is compliant with SAR for general population/uncontrolled exposure limits in IC RSS-102 and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528. This equipment should be installed and operated with minimum distance 0.5 cm between the radiator & your body.
This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter. The County Code Selection feature is disabled for products marketed in the US/Canada.

CE

a. Caution:
• Risk of explosion if battery replaced by an incorrect type.
• Dispose of used batteries according to the instructions.
b. Make sure the temperature for adapter will not be higher than 40 ˚C.

CE SAR Compliance

This device meets the EU requirements (1999/519/EC) on the limitation of exposure of the general public to electromagnetic fields by way of health protection.
The limits are part of extensive recommendations for the protection of the general public. These recommendations have been developed and checked by independent scientific organizations through regular and thorough evaluations of scientific studies. The unit of measurement for the European Council's recommended limit for mobile devices is the "Specific Absorption Rate" (SAR), and the SAR limit is 2.0 W/ kg averaged over 10 gram of body tissue. It meets the requirements of the International Commission on Non-Ionizing Radiation Protection (ICNIRP). For body worn operation, this device has been tested and meets the ICNIRP exposure guidelines and the European Standard EN 62311 and EN 62209-2, for use with dedicated accessories. Use of other accessories which contain metals may not ensure compliance with ICNIRP exposure guidelines.

Canada

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.
Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

Antenna Statement

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Licence exempt

This device complies with Industry Canada licence-exempt RSS standard (s). Operation is subject to the following two conditions:
(1) this device may not cause interference, and
(2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :
(1) l'appareil ne doit pas produire de brouillage, et
(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Europe / EU Conformance

The following CE compliance information is applicable to this device that carry the following CE mark:

This product has been tested and found to comply with all requirements for CE Marking and sale within the European Economic Area (EEA).
The Trimble Geo 5T has Bluetooth wireless technology approval in most EU countries and satisfies the requirements for Radio and Telecommunication Terminal Equipment specified by European Council Directive 1999/5/EC. These requirements provide reasonable protection against harmful interference when the equipment is operated appropriately in a residential or commercial environment.
Geo 5T handhelds equipped with wireless cellular modem radios are intended for connection to European Networks operating with GSM 900, or GSM 1800. A copy of the CE Declaration of Conformity for the Geo 5T handheld can be accessed from http://www.trimble.com/support.shtml.

Australia and New Zealand

This product conforms with the regulatory requirements of the Australian Communications Authority (ACA) EMC and Radiocommunications framework, thus satisfying the requirements for C-Tick Marking and sale within Australia and New Zealand.

Additionally, Geo 5T 3.5G products that incorporate a modem also comply with the requirements for A-Tick Marking and sale in Australia.

Taiwan – Battery Recycling Requirements

The product contains a removable Lithium-ion battery. Taiwanese regulations require that waste batteries are recycled.

廢電池請回收

Japan

This device has been granted two designation numbers by Ministry of Internal Affairs and Communications: according: Ordinance concerning Technical Regulations Conformity Certification etc. of Specified Radio Equipment (特定無線設備の技術基準適合証明等に関する規則)
Article 2 clause 1 item 19
Approval no: 204WW21008300. This device should not be modified (otherwise the granted designation number will be invalid).

European Union Customers: (WEEE)

For product recycling instructions and more information, please go to www.trimble.com/ev.shtml.
Recycling in Europe: To recycle Trimble WEEE (Waste Electrical and Electronic Equipment, products that run on electrical power.), Call +31 497 53 24 30, and ask for the "WEEE Associate". Or, mail a request for recycling instructions to:
Trimble Europe BV
c/o Menlo Worldwide Logistics
Meerheide 45
5521 DZ Eersel, NL

Safety Information

Radio use

The Trimble® Geo 5T handheld contains a Bluetooth® radio. Some models also include a cellular modem radio. In some situations, you may be required to turn off the radios. For example, aviation authority regulations restrict the use of wireless transmission devices on board aircraft.

To prevent the handheld from emitting radio signals, do one of the following:

- To turn off the handheld, press the Power button to display the Power menu then tap Shutdown.
- To turn off the Bluetooth and wireless cellular modem radios only:

  a. Tap the title bar on the Home or Start screen, and then on the pull-down list, tap the or icon.

  b. In the Connectivity or the Phone dialog, select Wireless Manager.

  c. Tap All to turn off all radios. The status fields below the Bluetooth and Phone buttons change to Off.

Deactivating the integrated Bluetooth radio

The Geo 5T handheld is shipped with Bluetooth wireless technology activated. To use the Bluetooth radio, you need to turn it on (see Turning on and turning off the integrated radios, page 49).

Note – *You may need to deactivate the Bluetooth radio in the handheld if the country in which you are working does not approve the use of Bluetooth wireless technology. If you are unsure about whether the Geo 5T handheld's radios are approved for use in your country, check with your Trimble reseller.*

Use the Radio Activation Manager software to deactivate the integrated Bluetooth radio, or to reactivate the radio if it has been deactivated. The Radio Activation Manager software runs on an office computer.

The latest copy of the software is available for download from the Trimble website. Go to www.trimble.com/support.shtml, click the link for your receiver type (Geo 5T), click Downloads, click Geo 5T and then click Radio Activation Manager.

RF Exposure Information (SAR)

This device meets the government's requirements for exposure to radio waves. This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government. The exposure standard for wireless devices employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6W/kg. Tests for SAR are conducted using standard operating positions accepted by the FCC with the device transmitting at its highest certified power level in all tested frequency bands. Although the SAR is determined at the highest certified power level, the actual SAR level of the device while operating can be well below the maximum value. This is because the device is designed to operate at multiple power levels so as to use only the poser

required to reach the network. In general, the closer you are to a wireless base station antenna, the lower the power output.

The highest SAR value for the device as reported to the FCC when worn on the body, as described in the user guide, is no more than 0.39 W/kg for GSM850 / 1.23 W/kg for PCS1900 (Body-worn measurements differ among device models, depending upon available accessories and FCC requirements.) While there may be differences between the SAR levels of various devices and at various positions, they all meet thegovernment requirement. The FCC has granted an Equipment Authorization for this device with all reported SAR levels evaluated as in compliance with the FCC RF exposure guidelines. SAR information on this device is on file with the FCC and can be found under the Display Grant section of www.fcc.gov/oet/ea/fccid after searching on FCC ID: NZI802111A.

This device is compliant with SAR for general population /uncontrolled exposure limits in ANSI/IEEE C95.1-1999 and had been tested in accordance with the measurement methods and procedures specified in OET Bulletin 65 Supplement C. For body worn operation, this device has been tested and meets the FCC RF exposure guidelines for use with an accessory that contains no metal and the positions the handset a minimum of 0.5 cm from the body. Use of other accessories may not ensure compliance with FCC RF exposure guidelines. If you do not use a body-worn accessory and are not holding the device at the ear, position the handset a minimum of 0.5 cm from your body when the device is switched on.

Exposure to radio frequency radiation from Bluetooth transmitters

This device is approved as a portable device with respect to Radio Frequency (RF) exposure compliance. The radiated output power of the internal wireless radio transmitters is less than 100 milliwatt, which results in exposure levels far below the FCC radio frequency exposure limits, even when operated in close proximity to the body. The internal wireless radios operate within guidelines found in international radio frequency safety standards and recommendations, which reflect the consensus of the international scientific community. Trimble therefore believes the internal wireless radios are safe for use by users. The level of electromagnetic energy emitted is hundreds of times lower than the electromagnetic energy emitted by wireless devices such as mobile phones. However, the use of wireless radios may be restricted in some situations or environments, such as on aircraft. If you are unsure of restrictions, you are encouraged to ask for authorization before turning on the wireless radios.

Exposure to radio frequency radiation from cellular wireless transmitters

Geo 5T handhelds equipped with wireless cellular modem radios have been designed and manufactured to meet safety requirements for limiting exposure to radio waves. When used in accordance with the instructions set forth in this manual, the equipment has been independently verified to not exceed the emission limits for safe exposure to radio frequency (RF) energy as specified by the Federal Communications Commission of the U.S. Government in 47 CFR §2.1093. These limits are part of comprehensive guidelines and establish permitted levels of RF energy for the general population. The guidelines are based on standards that were developed by independent scientific organization through periodic and thorough evaluation of scientific studies. The standards include a substantial safety margin designed to assure the safety of all persons, regardless of age and health.

AC Adaptor safety

To charge the handheld's battery, use the docking station and adaptor kit provided with the Geo 5T handheld (see Powering the handheld, page 17).

WARNING -To use AC adaptors safely
– Use only the AC adaptor intended for the Geo 5T handheld. Using any other AC adaptor can damage the handheld and may void your warranty. Do not use the AC adaptor with any other product.
– Make certain that the input voltage on the adaptor matches the voltage and frequency in your location.
– Make certain that the adaptor has prongs compatible with your outlets.
– Do not use the AC adaptor in wet outdoor areas; it is designed for indoor use only.
– Unplug the AC adaptor from power when not in use.

Electrostatic discharge

WARNING - Static electricity can harm electronic components inside your handheld. To prevent static damage:
- Discharge static electricity from your body before you touch any of the electronic components inside your device, such as a memory module. You can do so by touching an unpainted metal surface.

The Geo 5T handheld is designed for outdoor conditions; however under conditions of low humidity extremely high voltage discharge events are possible. Users are advised that the risk of causing discharge to sensitive electronics can be minimized by avoiding finger contact to the recessed connectors at the sides of the unit.

Battery safety

The removable rechargeable Lithium-ion battery is supplied partially charged. Charge the battery completely before using it for the first time (see Powering the handheld, page 17). If the battery has been stored for longer than six months, charge it before use.

WARNING - Use only the battery intended for the Trimble Geo 5T handheld. Using any other battery can damage the handheld and may void your warranty. If the battery becomes damaged or stops charging fully, replace it with a new battery.

WARNING - Do not damage the rechargeable Lithium-ion battery. A damaged battery can cause an explosion or fire, and can result in personal injury and/or property damage.
To prevent injury or damage:
– Do not use or charge the battery if it appears to be damaged. Signs of damage include, but are not limited to, discoloration, warping, and leaking battery fluid.
– Do not store or leave your device near a heat source such as near a fireplace or other heat-generating appliance, or otherwise expose it to temperatures in excess of 70 °C (158 °F) such as on a vehicle dashboard. When heated to excessive temperatures, battery cells could explode or vent, posing a risk of fire.
– Do not immerse the battery in water.
– Do not use or store the battery inside a vehicle during hot weather.
– Do not drop or puncture the battery.
– Do not open the battery or short-circuit its contacts.

WARNING -Avoid contact with the rechargeable Lithium-ion battery if it appears to be leaking. Battery fluid is corrosive, and contact with it can result in personal injury and/or property damage.
To prevent injury or damage:
– If the battery leaks, avoid contact with the battery fluid.

– If battery fluid gets into your eyes, immediately rinse your eyes with clean water and seek medical attention. Do not rub your eyes!
– If battery fluid gets onto your skin or clothing, immediately use clean water to wash off the battery fluid.

WARNING -Charge and use the rechargeable Lithium-ion battery only in strict accordance with the instructions. Charging or using the battery in unauthorized equipment can cause an explosion or fire, and can result in personal injury and/or equipment damage.
To prevent injury or damage:
– Do not charge or use the battery if it appears to be damaged or leaking.
– Charge the Lithium-ion battery only in a Trimble product that is specified to charge it. Be sure to follow all instructions that are provided with the battery charger.
– Discontinue charging a battery that gives off extreme heat or a burning odor.
– Use the battery only in Trimble equipment that is specified to use it.
– Use the battery only for its intended use and according to the instructions in the product documentation.

Storage card use

The Geo 5T handheld provides a storage card slot, providing an alternative storage location to the storage memory in the handheld.

WARNING - Static electricity can harm electronic components inside your handheld. To prevent static damage:
- Discharge static electricity from your body before you touch any of the electronic components inside your device, such as a memory module. You can do so by touching an unpainted metal surface.

WARNING- The presence of any dust or moisture in the memory card slot may adversely affect the device and void your Trimble warranty. To prevent dust or moisture entering the memory card slot:
– Make certain that the storage card slot door is attached correctly when you are using the handheld outdoors.
– When inserting or removing a memory card, place the handheld on a dust-free indoor surface.

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About the Trimble Geo 5T handheld

The Trimble Geo 5T rugged handheld is rated IP54, and combines a high sensitivity GNSS receiver with the Windows® Embedded Handheld 6.5 Professional operating system.

The Trimble Geo 5T handheld has built-in Bluetooth® wireless technology for cable-free connection to other devices, and an integrated 0MP camera with autofocus and flash.

One model of the Trimble Geo 5T handheld also has an integrated cellular modem for downloading and transmitting data.

The integrated GNSS receiver provides accurate submeter positioning information when using postprocessed or real-time differential corrections. For more information, see Using the GNSS receiver, page 70.

About this user guide

The Trimble Geo 5T Handheld User Guide describes how to set up and use the Trimble Geo 5T handheld. The information in this guide supplements the information in the *Trimble Geo 5T Handheld Quick Start Guide*, which you received with the handheld.

Even if you have used other Global Navigation Satellite System (GNSS) or Global Positioning System (GPS) products before, Trimble recommends that you spend some time reading this guide to learn about the special features of the product.

Collecting GNSS data

To collect GNSS data with the Trimble Geo 5T handheld, you must install GNSS field software onto the handheld.

You can use the Trimble Geo 5T handheld with compatible Mapping and GIS field and office software. For version numbers and a complete list, see the Product Compatibility List on www.trimble.com.

For more information on using the integrated GNSS receiver, see Using the GNSS receiver, page 70.

Use and care of the handheld

When using the handheld:

- Protect the touch screen by using your finger or the stylus provided, and avoid using excessive pressure and sharp or abrasive objects. To protect the touch screen from pressure and abrasive objects, Trimble recommends that you apply a screen protector.
- Keep the outer surface free of dirt and dust.

- Ensure that protective covers are appropriately fitted to the external antenna port, USB and power connectors, so that they are kept free from dirt, dust, fluid ingress, and electrostatic discharge.
- Protect the handheld from extreme temperatures. For example, do not leave the handheld on the dashboard of a vehicle.
- The handheld is rated IP54, but is not waterproof. Do ***not*** immerse the handheld in water, and be careful not to drop the handheld or subject it to any strong impact.

To clean the handheld, wipe it with a clean dry cloth.

Storing the handheld

If you are not going to use the handheld for three months or more, Trimble recommends that you do not leave the handheld in Suspend mode. Instead, partially charge the battery and then turn off the handheld.

To prepare the Trimble Geo 5T handheld for storage:

1. Transfer any data that you need to an office computer.
2. Charge the battery to approximately 30%.
3. Press and hold the **Power** button to turn off the handheld.
4. Store the handheld at room temperature.

To use the Trimble Geo 5T handheld after storage:

1. Press and hold the **Power** button until the handheld turns on, then release the **Power** button.
2. Recharge the battery (See Charging the battery inside the handheld, page 19).

Technical assistance

Go to the Trimble Geo 5T handheld technical support page on the Trimble website www.trimble.com/mappingGIS/geo5t.aspx for the latest support information, including:

- FAQs
- support notes detailing support issues
- documentation
- the latest files available for download

Additional help

If you still cannot find the information that you need, contact your Trimble reseller.

Windows error reporting

If for any reason a Microsoft® Windows Error Reporting dialog appears, indicating that the handheld or Trimble field software has encountered a problem and needs to close, you are prompted to send an error report to Microsoft.

Trimble recommends that you click **Send** and then click any subsequent links that are used to obtain additional information.

Trimble can access the report that is sent to Microsoft and use it to improve the Trimble Geo 5T handheld.

Parts of the Trimble Geo 5T handheld

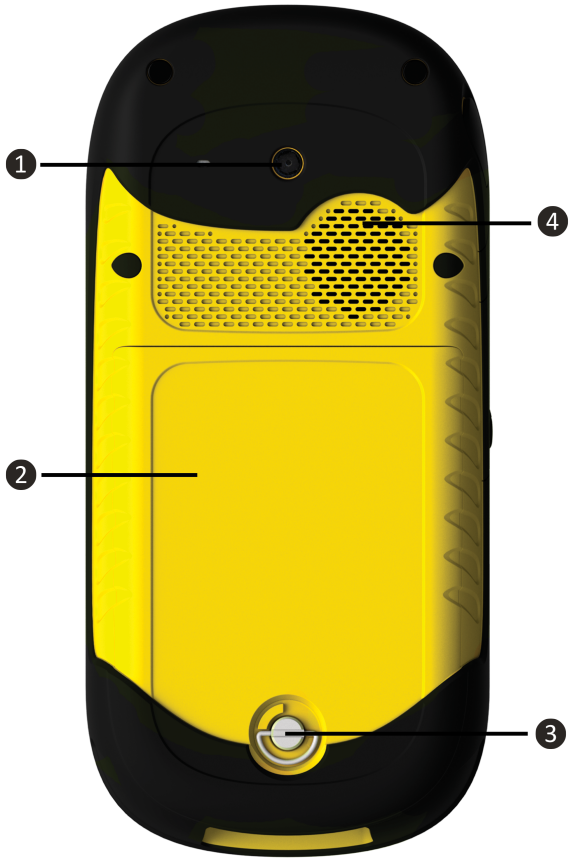
This section describes the main features of the Trimble Geo 5T handheld, and provides the information you need to get up and running with the handheld.

Trimble Geo 5T handheld - front view

1. Stylus
2. Touch screen
3. Enter button
4. Power / data connector
5. Microphone
6. Scroll button
7. Integrated GNSS receiver

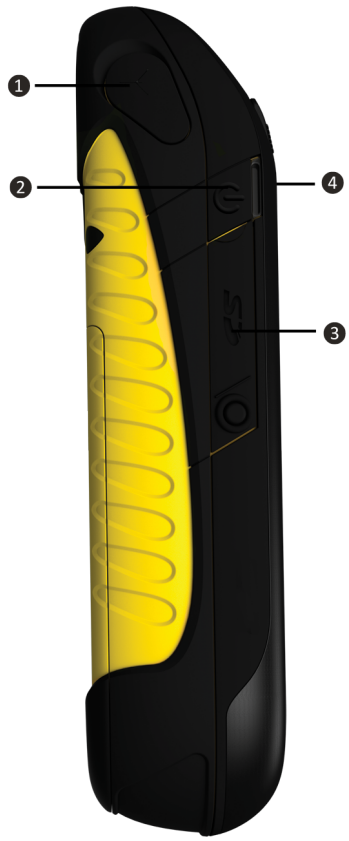
Tip – To lock the screen and handheld keys without turning off the handheld, use the device lock option (see Device lock, page 37).

Trimble Geo 5T handheld – back view



1. Camera lens
2. Battery compartment
3. Battery cover door lock
4. Speaker

Trimble Geo 5T handheld - side view



1 External antenna connector

2 Power button

3 SDIO card slot

4 Power LED

Powering the handheld

The Trimble Geo 5T handheld contains a rechargeable Lithium-ion battery.

Note – *Charge the battery completely before using the handheld for the first time. If the battery has been stored for longer than six months, charge it before use. Trimble recommends charging the battery for four hours to recharge it fully.*

Note – *Cold temperatures, or using Bluetooth wireless technology or using the cellular modem consumes additional battery power and so shortens battery life between charges.*

Battery safety

WARNING - Use only the battery intended for the Trimble Geo 5T handheld. Using any other battery can damage the handheld and may void your warranty. If the battery becomes damaged or stops charging fully, replace it with a new battery.

WARNING - Do not damage the rechargeable Lithium-ion battery. A damaged battery can cause an explosion or fire, and can result in personal injury and/or property damage.
To prevent injury or damage:
– Do not use or charge the battery if it appears to be damaged. Signs of damage include, but are not limited to, discoloration, warping, and leaking battery fluid.
– Do not store or leave your device near a heat source such as near a fireplace or other heat-generating appliance, or otherwise expose it to temperatures in excess of 70 °C (158 °F) such as on a vehicle dashboard. When heated to excessive temperatures, battery cells could explode or vent, posing a risk of fire.
– Do not immerse the battery in water.
– Do not use or store the battery inside a vehicle during hot weather.
– Do not drop or puncture the battery.
– Do not open the battery or short-circuit its contacts.

WARNING -Avoid contact with the rechargeable Lithium-ion battery if it appears to be leaking. Battery fluid is corrosive, and contact with it can result in personal injury and/or property damage.
To prevent injury or damage:
– If the battery leaks, avoid contact with the battery fluid.
– If battery fluid gets into your eyes, immediately rinse your eyes with clean water and seek medical attention. Do not rub your eyes!
– If battery fluid gets onto your skin or clothing, immediately use clean water to wash off the battery fluid.

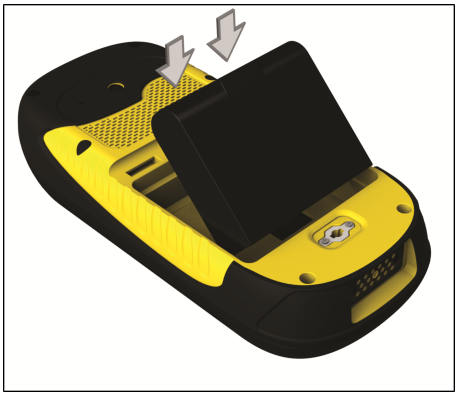
WARNING -Charge and use the rechargeable Lithium-ion battery only in strict accordance with the instructions. Charging or using the battery in unauthorized equipment can cause an explosion or fire, and can result in personal injury and/or equipment damage.
To prevent injury or damage:
– Do not charge or use the battery if it appears to be damaged or leaking.
– Charge the Lithium-ion battery only in a Trimble product that is specified to charge it. Be sure to follow all instructions that are provided with the battery charger.
– Discontinue charging a battery that gives off extreme heat or a burning odor.
– Use the battery only in Trimble equipment that is specified to use it.
– Use the battery only for its intended use and according to the instructions in the product documentation.

Inserting and removing the battery

To insert the battery into the handheld:

1. On the back of the handheld, turn the back cover lock counter-clockwise to unlock it. Pull the back cover toward you to remove it.

2. To insert the battery, angle the bottom of the battery into the handheld first, with the label facing upwards. Press the battery flat into place.



3. To replace the back cover, insert the top edge of the cover first, and then push it flat until the bottom clicks into place. Turn the lock clockwise to secure the back cover.

To remove the battery, remove the back cover of the handheld and then pull the top of the battery towards you.

CAUTION - The handheld is not sealed from water and dust when the battery cover is removed. Trimble recommends only removing the battery for short periods of time and only removing the battery indoors or from inside the protection of a vehicle.

Charging the battery inside the handheld

Use the docking station to charge the battery in the handheld.

1. Connect the AC power adaptor to the Power socket on the docking station and then connect the adaptor to mains power. An international adaptor kit is provided with the handheld.
2. Sit the handheld in the front of the docking station, and check that the Power LED on the handheld is solid red, indicating that the handheld is properly connected to the docking station and battery is charging.

When the handheld is docked, the Power LED on the handheld is solid green when the internal battery is fully charged. Fully charging the battery from empty takes approximately four hours. The Power LED on the handheld indicates the battery power or charging status, as shown below:

LED State	Handheld / battery state
Solid red	Battery is charging.
Solid green	Occurs at power-up for a few seconds when the battery has fully charged.
Flashes red every 5 seconds	Windows Mobile notification.
Flashes green every 5 seconds	Handheld is in Suspend mode.
Flashing red at 1 second intervals	Battery charging is suspended due to overheating. Battery charging will resume when the temperature drops below the upper limit. If the flashing persists and charging does not resume, replace the battery.

Avoid keeping the battery at full charge at high temperatures. For more information, see Use and care of the handheld, page 13.

Note – *The life of the battery can be significantly shortened if power is constantly supplied to the handheld. To avoid this issue, connect the handheld to an external power source only when the battery requires charging. Once fully charged, disconnect the external power source and allow the battery to discharge through normal use.*

Note – *You cannot charge the battery inside the handheld using the POGO cable or cigarette lighter adaptor.*

Charging a battery outside of the handheld

You can dock a spare battery at the back of the docking station to charge it outside of the handheld. Insert the battery with the label facing inwards. The light indicator turns red, indicating that the battery is charging. The battery is fully charged when the light indicator turns green.

Note – *When charging a battery inside the handheld and charging a spare battery at the same time, the spare battery will charge slower than the internal battery. When the internal battery is fully charged, the spare battery will charge faster.*

Checking the level of battery power

To check the level of battery power remaining at any time while the device is running, tap the title bar of the *Home* screen and then tap in the pull-down list.

The Power control appears, displaying the *Battery* tab.

When the handheld battery is recharging from an external power source, the battery icon in the *Home* screen changes to . You can still tap the icon to view the level of battery power.

Low battery indicators

When the battery status indicator shows a low battery charge (see Status indicators, page 27), Trimble recommends that you recharge the battery.

If you dismiss two consecutive low battery alerts, the handheld automatically enters Suspend mode.

Conserving power

Trimble recommends that you do the following to reduce power consumption:

- Set the handheld to automatically turn off when idle. For more information, see Turning on and turning off the handheld, page 21.
- Set the backlight to automatically turn off when the handheld is idle for a specified time. For more information, see Backlight, page 40.
- Reduce the brightness setting for the backlight. For more information, see Backlight, page 40.
- Turn off the integrated Bluetooth radio or cellular modem whenever you are not using them. For more information, see Turning on and turning off the integrated radios, page 49.

Note – *Do not disconnect from GNSS if you will be reconnecting within about five minutes. A GNSS application can take up to 30 seconds to reactivate the integrated GNSS receiver, so disconnecting to save power can cost time.*

Turning on and turning off the handheld

If the screen on the handheld is blank, the handheld is in Suspend mode or has been shut down. To turn on the handheld, press the **Power** button until the screen lights up.

To put the handheld into Suspend mode, press the **Power** button briefly (less than five seconds). The handheld is placed in a very low power state, but the Bluetooth and wireless cellular modem radios may remain active.

To completely shut down the handheld, press and hold the **Power** button until the message Saving parameters appears. All running applications are shut down, and the handheld is completely turned off.

When the handheld is ***not*** docked, the Power LED on the handheld shows one of the following:

LED State	Handheld state
Solid green	Occurs at power-up for a few seconds.
Off	Off.
Flashes red every 5 seconds	Windows Mobile notification(s).
Flashes green every 5 seconds	Handheld is in Suspend mode.

Suspend mode

When you press the **Power** button briefly to turn off the handheld, the handheld goes into Suspend mode. This is a low-power mode that maintains the main memory contents and keeps applications running but does not allow you to operate any of the handheld's functions. The handheld appears to be turned off. The integrated GNSS receiver is turned off and any application using GNSS is disconnected.

If the Bluetooth and wireless cellular modem radios were on, they will remain turned on. The handheld is capable of receiving data via Bluetooth or the cellular modem radio while it is in Suspend mode. The handheld is able to automatically wake up to calendar alarms if it is in Suspend mode.

CAUTION - To save battery power, use the Wireless Manager to turn off the wireless radios before you place the handheld into Suspend mode.

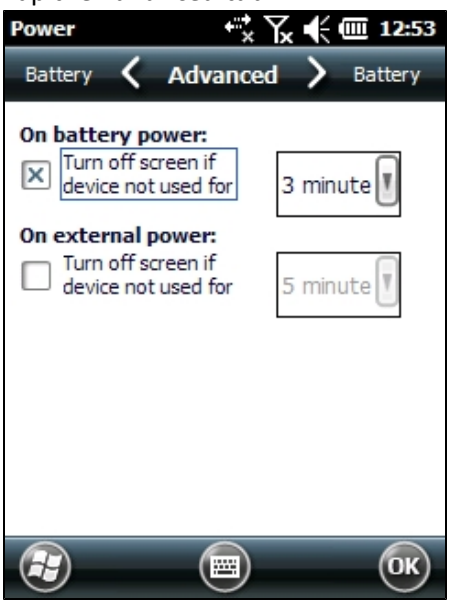
To turn on the handheld when it is in Suspend mode, press the **Power** button briefly until the screen lights up. The handheld is immediately ready for operation. There may be a delay of up to 30 seconds while the integrated GNSS receiver automatically reactivates.

The handheld may go into Suspend mode automatically if you dismiss two consecutive low battery alerts. Charge the battery before you resume work.

You can configure the handheld to automatically enter Suspend mode when it has been idle for a specified time. By default, the handheld is set to enter Suspend mode if it is not used for three minutes.

To change the time before the handheld enters Suspend mode:

1. Tap the title bar of the *Home* or the *Start* screen and then tap . The Power control appears, displaying the *Battery* tab.
2. Tap the *Advanced* tab.



3. From the *On battery power* option, select the *Turn off screen if device not used for* check box and then select the idle time from the drop-down list.
4. Tap **OK**.

Resetting the handheld

If the screen on the handheld is blank, the handheld has turned off. Press and hold the **Power** button until the handheld turns on, then release the **Power** button.

If the handheld stops responding to the stylus, or if it does not respond when you press any of the keypad buttons, you may need to reset it. Simultaneously press the ESC, IN, and Enter buttons on the handheld. If the reboot fails, remove and then replace the battery.

Storing data

The handheld has two types of memory:

- Storage memory is similar to the hard disk in a computer, and is used for storing programs and data.
- Program memory is similar to the RAM in a computer, and is used for running programs. You cannot use it to save data.

To check the memory capacity on the handheld, tap / *Settings* / *System* / *Memory*. The Storage and Program columns show the current memory available, and the memory that is already in use.

Pre-installed documents and program files are not affected by power loss or resetting. However, you can still lose data if you accidentally delete or overwrite it.

CAUTION - The Windows Embedded Handheld 6.5 Professional operating system does not include a Recycle Bin. When you delete files from the handheld, they are deleted permanently.

Trimble recommends that you regularly copy important data to an office computer. For more information, see Connecting to an office computer, page 44.

Memory cards

As an alternative to storage memory, you can save data to a memory card. Use either an SD or an SDHC (high capacity) memory card to securely transfer data to and from another device that supports SD or SDHC memory cards.

WARNING- The presence of any dust or moisture in the memory card slot may adversely affect the device and void your Trimble warranty. To prevent dust or moisture entering the memory card slot:
– Make certain that the storage card slot door is attached correctly when you are using the handheld outdoors.
– When inserting or removing a memory card, place the handheld on a dust-free indoor surface.

WARNING - Static electricity can harm electronic components inside the handheld. To prevent static damage, discharge static electricity from your body before you touch any of the electronic components inside your device, such as a memory module. You can do so by touching an unpainted metal surface.

To insert an SD or SDHC memory card:

1. Turn off the handheld. See Turning on and turning off the handheld, page 21.
2. Remove the SDIO cover.
3. Insert the SD or SDHC card into the card slot.
4. Replace the cover.

5. When you select the *Save As* option in an application, the memory card appears in the list of available storage locations.

Note – *Do not store required data or applications to a memory card if the card will be removed. Data saved to a memory card is available only when the card is inserted in the handheld.*

Encrypting files on memory cards

To prevent sensitive data on a memory card from being used if the card is lost or stolen, files can be encrypted as they are placed on the card.

When encryption is enabled, an encryption key is stored on the handheld. Files are encrypted as they are copied or written to the memory card. Files already saved on memory cards before enabling encryption are not automatically encrypted.

Note – *Because the encryption key is stored on the handheld, encrypted files are only readable on the handheld on which they are initially encrypted. It is not possible to read encrypted files on the storage card with any other device, including another Trimble Geo 5T handheld or an office computer.*

CAUTION - If you reset the handheld to the factory default settings, the encryption key is deleted and the handheld is no longer able to read any encrypted files on a memory card. This means that any files you have encrypted are permanently locked and unreadable by any device. To avoid being unable to read previously encrypted files, Trimble recommends that you use another device, such as an office computer, as the primary location for storing important data and to control the encryption of important files.

To enable encryption of files as they are written to a memory card:

1. Tap / *Settings* / *System* / *Encryption*.
2. Select the *Encrypt files when placed on a storage card* check box.

Note – *Encrypted files appear as ordinary files on the handheld they were encrypted on. If the memory card is inserted in another device, the files appear with a .menc file extension and cannot be opened.*

To disable encryption, clear the *Encrypt files when placed on a storage card* check box.

Note – *Disabling encryption does not remove encryption from any existing files on the memory card, but ensures that new files placed onto the memory card are not encrypted.*

To encrypt files that are already stored on a memory card:

1. Copy the files to the handheld's internal memory or to an office computer.
2. Ensure encryption is enabled on the handheld.
3. Copy the files back to the memory card. The files are encrypted as they are written to the memory card.

To remove encryption from files so they can be read by other devices:

1. Insert the memory card in the handheld and then connect the handheld to an office computer (see Connecting to an office computer (page 44)).
2. Copy the encrypted files from the memory card to the office computer.

3. To use the decrypted files on the handheld, copy the files from the office computer to the handheld's main memory.
4. To store the decrypted files on a memory card, ensure that encryption is not enabled on the handheld and then copy the decrypted files from the office computer to the memory card.

Inserting and removing the SIM card

CAUTION - The SIM card and its contents can be easily damaged by scratches or bending. Use caution when inserting or removing the card.

CAUTION - The presence of any dust or moisture in the SIM card slot may adversely affect the device and void your Trimble warranty. To prevent dust or moisture entering the SIM card slot:
– When inserting or removing a SIM card, place the handheld on a dust-free indoor surface.

WARNING - Static electricity can harm electronic components inside the handheld. To prevent static damage, discharge static electricity from your body before you touch any of the electronic components inside your device, such as a memory module. You can do so by touching an unpainted metal surface.

To insert or remove a SIM card:

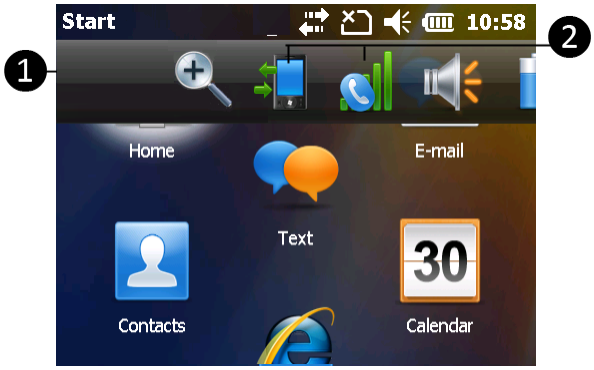
1. Turn off the handheld (see Turning on and turning off the handheld, page 21) and place it face down on a dust-free indoor surface.
2. Remove the battery cover door, and then remove the battery. See Inserting and removing the battery, page 18.
3. Insert or remove the SIM card, with the gold contacts face down.
4. Replace the battery and the battery cover door.

Using the Windows Embedded Handheld operating system

The Trimble Geo 5T handheld is powered by the Windows Embedded Handheld 6.5 Professional operating system. The main parts of the *Home* screen and the *Start* screen are shown below.

1. Home screen: provides access to the key functions on your handheld. Scroll, and tap any item to open it.
2. Title bar: contains status icons for important system functions
3. Start button: tap to open the Start screen, where you can access programs and system controls.
4. Tile bar: contains touchable tiles providing access to applications, menus, and notifications.

1. Start screen: tap any item on the screen to open it.
2. Lock device: tap to lock the screen.



1. Pull down list: tap anywhere on the title bar to open the title bar pull-down list, where you can access connectivity controls (the Wireless Manager), battery information, time and date settings, and volume.
2. Connectivity icons: tap either icon to access the Wireless Manager.

Status indicators

Status indicators that appear in the title bar at the top of the screen are as follows:

Battery status indicators

Icon	Description
	Battery has full charge
	Battery has high charge
	Battery has medium charge
	Battery has low charge
	Battery has very low charge
	Battery charging/using external power

The battery status icon on the title bar of the *Home* screen or the *Start* screen shows the status of the battery charge. Tap the title bar and then on the pull-down list tap the icon to access the Power control dialog. See Checking the level of battery power , page 20.

Network and modem status indicators

Icon	Description
	Connected to ActiveSync® or Windows Mobile Device Center
	Connected to a Bluetooth-enabled phone

Icon	Description
	Disconnected from ActiveSync or WMDC
	Disconnected from a Bluetooth-enabled phone
	Maximum cellular modem signal strength
	No cellular modem signal
	Cellular modem is turned off
	No cellular service
	Searching for cellular modem service
	Data is transferring using the cellular modem
	No SIM card
	UMTS network is available
	UMTS network is connecting
	Analog network is available
	EDGE network is available
	EDGE network is connecting
	EDGE connection is active
	GPRS network is available
	GPRS network is connecting
	GPSR connection is active
	HSDPA network is available
	HSDPA network is connecting
	HSDPA connection is active

The network and modem status icons on the title bar of the *Home* screen or the *Start* screen show the status of each radio. Tap the title bar and then on the pull-down list tap the or icon. In the Connectivity or Phone dialog, select Wireless Manager and turn on or turn off the radio.

Speaker status indicators

Icon	Description
	Speaker is on
	Speaker is off

The speaker status icon on the title bar of the *Home* screen or the *Start* screen shows the status of the speaker. Tap the title bar and then on the pull-down list tap the icon to adjust the volume and to turn the speaker on or off.

Pre-installed programs

Programs that are pre-installed on the Trimble Geo 5T handheld are as follows:

Icon	Program	Function
	ActiveSync	Synchronize information between the handheld and a computer.
	Alarms	Set alarms.
	Calculator	Perform basic arithmetic functions.
	Calendar	Keep track of appointments and arrange meetings.
	Contacts	Keep track of your friends and colleagues.
	File Explorer	View and manage files.
	Internet Explorer	Browse the World Wide Web.
	Messenger	Send instant messages using Windows Live™ Messenger.
	Notes	Create handwritten, typed, or recorded notes.
	Pictures and Videos	Take, view, and edit pictures, or record and launch video clips.
	Search Device	Search for a file or item stored on the handheld.
	Tasks	Keep track of your tasks.
	Windows Live	Access Windows Live services, including email, instant messenger and Internet search.
	Windows Media	Play Windows Media® or MP3 audio and video files.
	E-mail	Write, send, and receive email messages.
	Office Mobile 2010	Provides access to these Office Mobile applications: Excel® Mobile 2010, PowerPoint® Mobile 2010, OneNote® Mobile 2010, SharePoint WorkSpace Mobile 2010, and Word Mobile.

Interacting with the handheld

To interact with the handheld, use the stylus or your finger to tap items on the touch screen, or to scroll up or down.

Action	Definition
Tap	Touch the screen once to open items and select options.
Tap and hold	Tap and hold the stylus on an item to see a list of actions available for that item. On the pop-up menu that appears, tap

Action	Definition
	the action you want to perform.
Drag	Hold the stylus on the screen and drag across the screen to select text and images. Drag in a list to select multiple items.
Flick	Flick the stylus or your finger over the screen to scroll a page or a list up or down.

If at any time the touch screen does not respond correctly to stylus taps or your finger, realign it. For more information, see Screen, page 39.

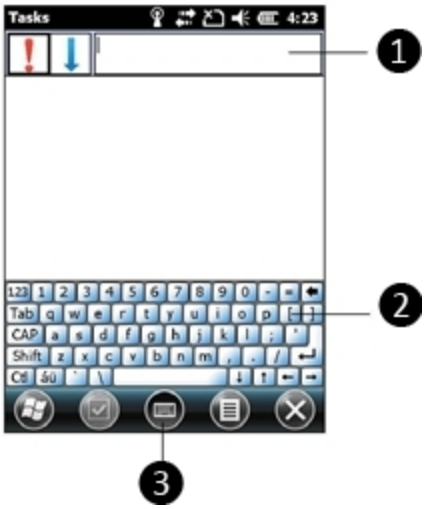
Entering information

Depending on the program you are using, you can enter information in several ways, as described below:

Input method	Description
Synchronizing	Use Microsoft connection management software to exchange information between the handheld and an office computer. For more information, see Connecting to an office computer, page 44.
Typing	Use the keyboard input panel to enter typed text by tapping keys on the on-screen keyboard.
Writing	Use the stylus like a pen to write directly on the screen.
Recording	Create a stand-alone recording or embed a recording into a note.

Using the on-screen keyboard

The keyboard button automatically appears in the tile bar of any application.



1	Textbox
2	Keyboard
3	Keyboard button

To display the keyboard, tap the keyboard button, or tap a text box in the application.

To enter characters, use your finger or the stylus to tap the keys on the keyboard. When you finish entering text in a field, tap Tab to accept the text you have entered and then move to the next field.

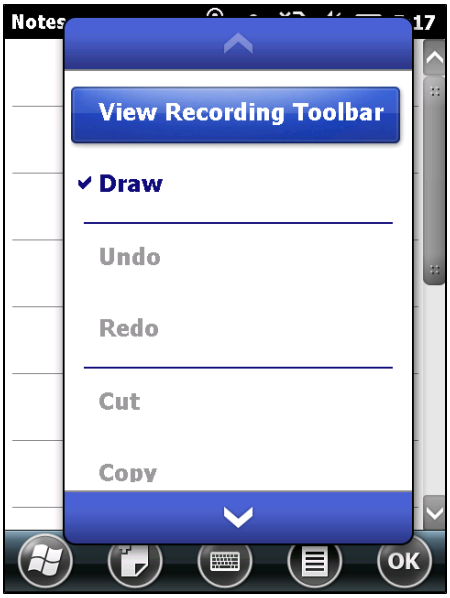
To enter special characters, tap 123 to display keyboards containing numbers and symbols. To switch back to the main keyboard, tap 123 again.

To hide the keyboard, tap the keyboard icon again.

Tip – To make the keys larger, tap / Settings / Personal / Input. In the *Input method* list, select Keyboard and then tap *Large Keys*.

Drawing and writing directly on screen

In some applications, for example Notes, you can draw (or write directly) on the screen using the stylus.



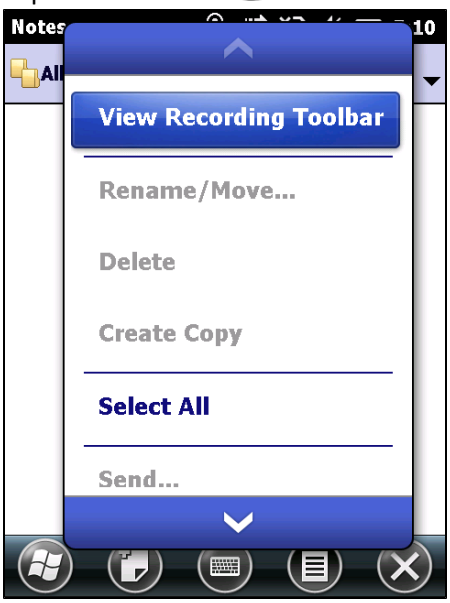
1. Tap and then tap the Notes icon
2. Tap the Menu icon .
3. Select *Draw*
4. Use the stylus to write or draw on the screen.

Making a recording

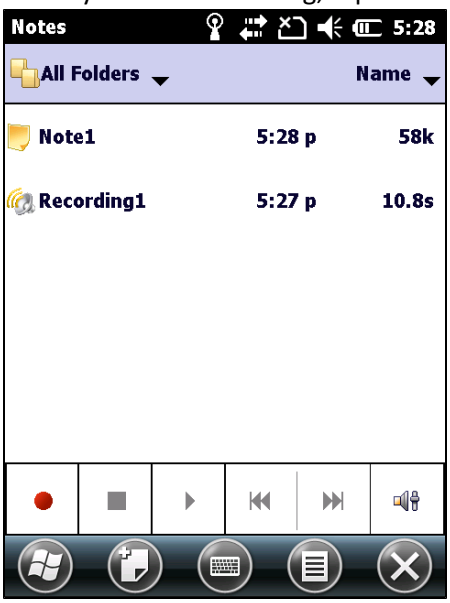
For handheld configurations equipped with an integrated microphone, you can create a stand-alone voice note or you can add a recording to a note. Then you can work with voice notes in the same way that you work with notes.

To make a recording:

1. Tap and then tap the Notes icon .
2. Tap the Menu icon .



3. Do one of the following:
   - To create a stand-alone recording, in the screen displaying the list of notes, tap the Record button to begin recording.
   - To add a recording to a note, create or open a note and then tap the Record button to begin recording.
4. When you finish recording, tap the Stop button .



5. If you are creating a stand-alone recording, an icon appears in the note list.

6. If you are recording in an open note, an icon appears in the note. Tap **OK** to return to the note list.

To play a recording, tap the recording in the note list or open the note and then tap the icon in the note.

Personalizing the handheld

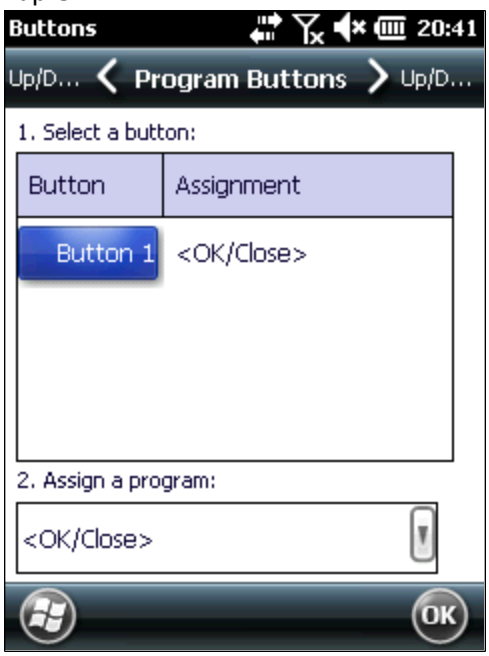
Use the controls in the *Settings* area to customize the handheld. The following examples describe the available controls.

Buttons

Use the *Buttons* control under *Personal* settings to assign the action you want to be performed when you press the Enter key.

By default, this key performs the Ok/Close action. You can program this key to perform another action from the drop-down list:

1. To open the *Buttons* control, tap / *Settings* / *Personal* / *Buttons*.
2. Specify an action for the button:
   a. Tap the *Program Buttons* tab.
   b. Tap a button in the list to select it.
   c. From the *Assign a program* drop-down list, select the action you want to occur when you press the button or tap the softkey.
   d. Tap **OK.**



Home

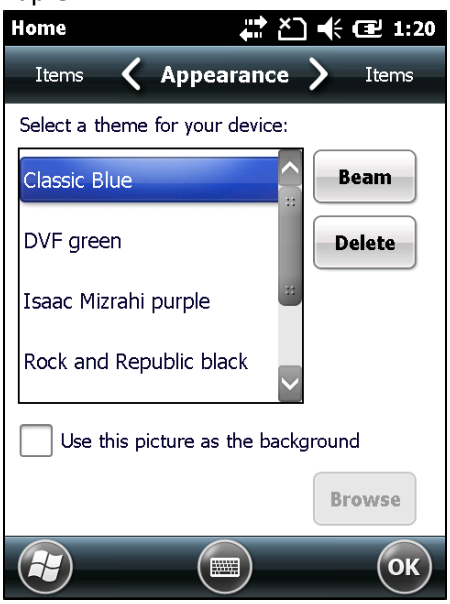
Use the *Home* settings to change the display theme that controls the appearance of the *Home* screen, and to customize how items appear on the *Home* screen.

Appearance

You can use a theme to customize the background picture on the *Home* screen, the color of the title and tile bars, menus, and messages.

To change the display theme:

1. Tap / *Settings* / *Home*.
2. Tap the *Appearance* tab.
3. Do one of the following:
   - To use a predefined theme, select it from the list.
   - To select the picture that you want to display in the *Home* screen background, select the *Use this picture as the background* check box. Then tap **Browse** to search for a file on the handheld.
4. Tap **OK**.



Items

You can choose between:

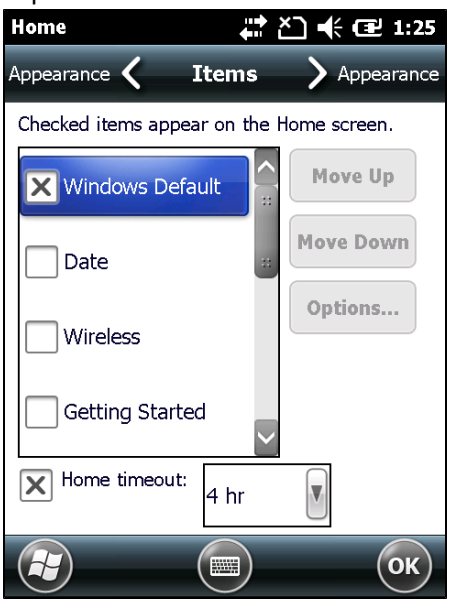
- the Windows default *Home* screen view, which allows you to flick through the list of entries, giving access to functions such as email, text messaging, current time, and Internet Explorer.
- customising which items appear on the *Home* screen and the order in which they appear.

To use the default *Home* screen view:

1. Tap / *Settings* / *Home*.
2. Tap the *Items* tab.
3. Select the *Windows Default* check box.
4. Tap **OK**.

To customise the items which appear on the *Home* screen:

1. Tap / *Settings* / *Home*.
2. Tap the *Items* tab.
3. Select or clear the check boxes to show or hide the *Home* screen items.
4. Use the **Move Up** and **Move Down** buttons to change where the selected item appears on the *Home* screen.
5. Tap **OK**.



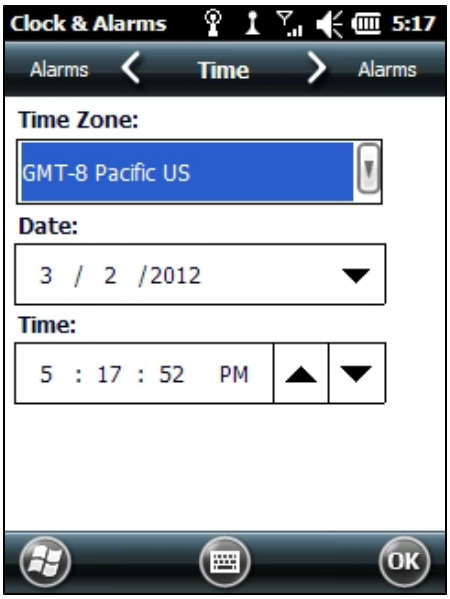
Set the time and date

1. On the *Home* screen, tap the clock item, or tap the title bar and then on the pull-down list, tap the clock icon . The *Clock & Alarms* screen appears.
2. Tap the *Time* tab.
3. In the *Time Zone* field, select the required time zone from the drop-down list.
4. In the *Date* field, tap the down arrow and then select the correct date.

Tip – On the calendar which appears, tap on the month or year to select the required value.

5. In the *Time* field, tap in turn the hour, minute, and second values and then tap the up or down

arrows to set the correct time.



Device lock

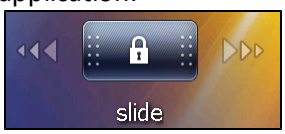
Tap the *Device Lock* icon on the *Start* screen to lock the screen and keypad while the handheld remains turned on.

Once the handheld is locked, the screen and most of the keys do not respond until the handheld is unlocked. The exception is the **Power** key, which always respond when pressed.

Communication with external devices such as a GNSS receiver, or external sensors used by GNSS field software, is not interrupted by locking the handheld. This means that you can keep using the GNSS field software when the handheld is locked. For example, you could lock the device so that you can safely transport it between features, while keeping the software connected to the GNSS receiver so that you can continue recording GNSS positions.

The lock screen provides multiple unlock sliders for different applications, when there are new notifications. For example, if a new email has arrived, an email unlock slider takes you straight to the email.

To unlock the device, slide the *Unlock* icon for the required application to take you straight to that application.



You can help to keep your data secure by requiring a password each time the handheld is turned on. Tap / *Settings* / *Lock* to set a password or to change password settings.

Power

To open the *Power* control, do one of the following:

- Tap the title bar of the *Home* screen or the *Start* screen, and then tap .
- Tap / *Settings* / *Power*.

Tap the *Battery* tab to check the battery level (see Checking the level of battery power (page 20)).

Tap the *Advanced* tab to set the time before the handheld turns off when idle (see Turning on and turning off the handheld, page 21).

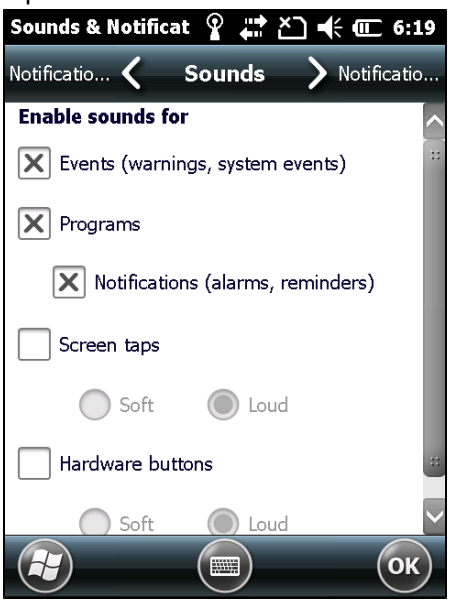
Sounds and notifications

Use the *Sounds & Notifications* control to set preferences for the speaker volume and system sounds. To open the *Sounds & Notifications* control:

- Tap / *Settings* / *Sounds & Notifications*.

To turn on or turn off sounds:

1. Tap the *Sounds* tab.
2. Select or clear the check boxes to enable or disable categories of sounds.
3. If you select the *Screen taps* or *Hardware buttons* check boxes, select the *Soft* or *Loud* option to control the volume of the sounds.
4. Tap **OK.**

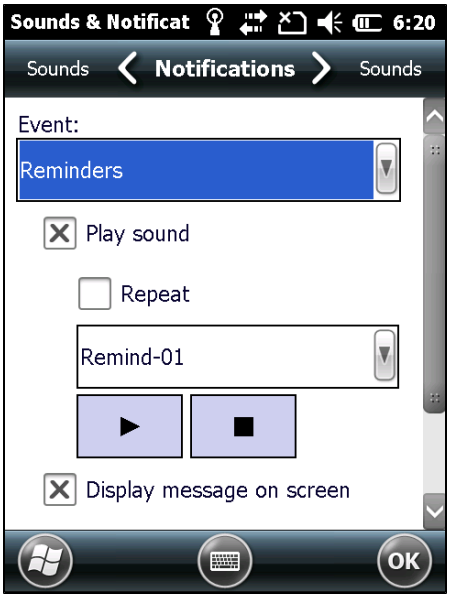


You can use predefined schemes to customize sounds, or you can create your own sound schemes.

To specify a sound scheme:

1. Tap the *Notifications* tab.
2. From the *Event* drop-down list, select an event.
3. Select the type of notification you want to receive for that event.

4. Tap **OK.**



Screen

Use the Screen control to align the touch screen or to change the appearance of text on the screen. To open the *Screen* control:

- Tap / *Settings* / *System* / *Screen*.

To change the screen settings:

1. Tap the *General* tab.
2. To change the orientation of the screen, select an option in the *Orientation* group.
3. To start the alignment sequence for the touch screen, tap **Align Screen**.
4. Tap **OK.**

Using ClearType font smoothing can make text easier to read on the screen.

Note – *ClearType is already on by default on the Geo 5T handheld.*

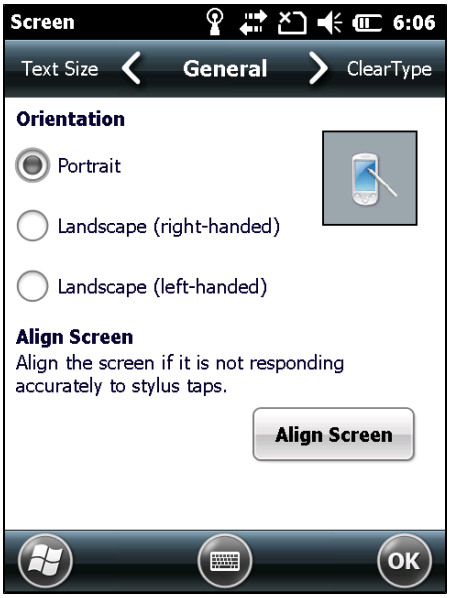
To enable ClearType:

1. Tap the *ClearType* tab and then select the *Enable ClearType* check box.
2. Tap **OK.**

To change the size of text on screen:

1. Tap the *Text Size* tab.
2. Tap and drag the slider control to the left to make text smaller, or to the right to make text larger.
3. The example text below the slider shows how the text will appear on screen.

4. Tap **OK**.

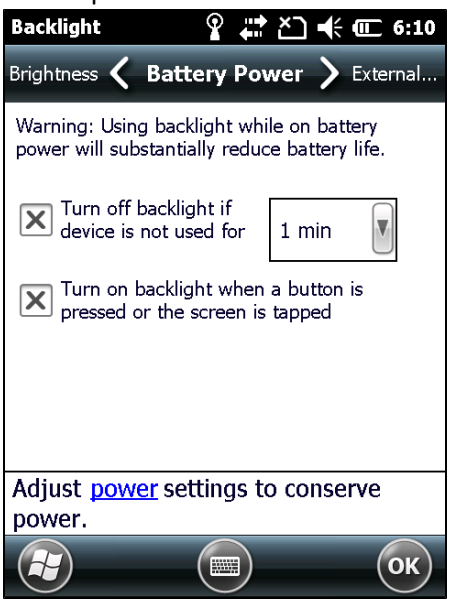


Backlight

The backlight makes the screen easier to read in low light, but uses extra power. Use the *Backlight* control to configure power-saving settings for the backlight. To open the *Backlight* control:

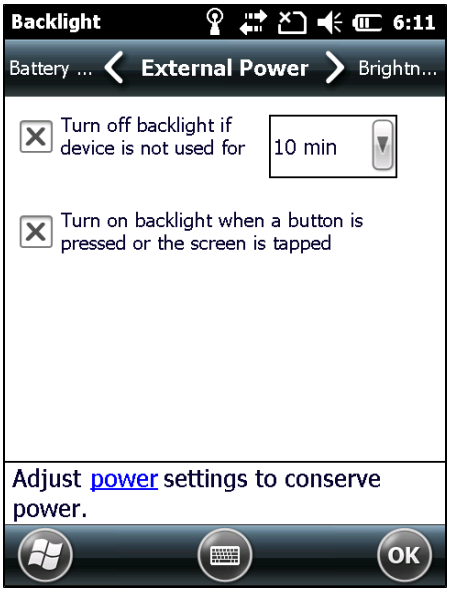
To set the backlight to automatically turn off:

1. Tap / *Settings* / *System* / *Backlight*.
2. To automatically turn off the backlight when the handheld is idle and is using ***battery power***, tap the *Battery Power* tab. Select the *Turn off backlight* check box and then select a time from the drop-down list.


Backlight
6:10
Brightness
Battery Power
External...
Warning: Using backlight while on battery power will substantially reduce battery life.
Turn off backlight if device is not used for
1 min
Turn on backlight when a button is pressed or the screen is tapped
Adjust power settings to conserve power.
OK

3. To automatically turn off the backlight when the handheld is idle and is using ***external power***, tap the *External Power* tab. Select the *Turn off backlight* check box and then select a time from

the drop-down list.



4. Tap **OK**.

To change the brightness:

1. Tap / *Settings* / *System* / *Brightness*.
2. Tap and drag the Brightness Level slider control to the left to make the backlight darker, or to the right to make the backlight brighter.
3. Tap **OK**.

Messaging

Use Messaging to send and receive email messages using the Trimble Geo 5T handheld. Messaging is the equivalent of your email Inbox.

To use email, you can do one of the following:

- Synchronize email messages with Microsoft Exchange or Microsoft Outlook® on an office computer.
- Send and receive email messages by connecting directly to an email server through an ISP or a network.

Synchronizing email messages

You can synchronize email messages on the handheld and the computer.

CAUTION - When you delete a message on the handheld, it is deleted from the office computer the next time you synchronize the devices.

To synchronize email, you must enable Inbox synchronization in the Microsoft ActiveSync technology (for Windows XP) or the WMDC (for Windows Vista® or Windows 7). For more information, refer to the *ActiveSync Help* or the *WMDC Help* on the office computer.

During synchronization:

- Messages are copied from the mail folders of Exchange or Outlook on the office computer to the Messaging folder on the handheld. By default, you will receive messages from the past 3 days only, the first 100 lines of each message, and file attachments of less than 100 KB in size.
- Email messages in the Outbox folder on the handheld are transferred to Exchange or Outlook, and then sent from those programs.
- Email messages in subfolders in other email folders in Outlook are synchronized only if they were selected for synchronization (using ActiveSync technology or the WMDC).

To send and receive email for a synchronized Exchange or Outlook account, connect the handheld to the office computer. Synchronization automatically begins, and the handheld sends and receives email.

Connecting directly to an email server

You can send and receive email messages by connecting to an email server. Before you can send and receive email, you must create an email account in the Messaging software.

Note – *You must set up an Internet connection on the handheld before you can set up and use your email account. For more information, see* *Connecting to a Bluetooth-enabled device , page 52**, or* *Connecting to a Bluetooth-enabled phone for Internet access , page 57*

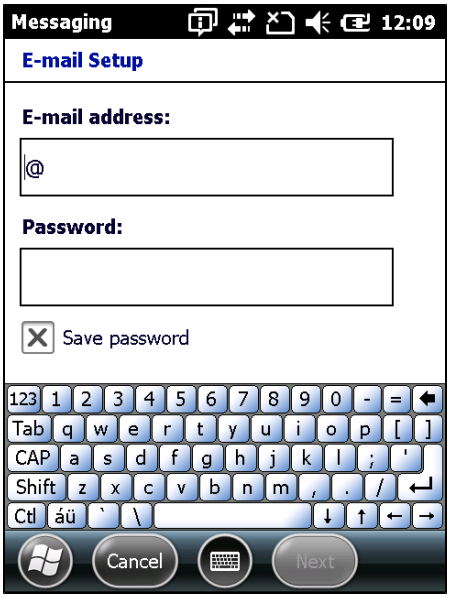
If you need to connect to different mailboxes, set up and name a different service for each connection.

Note – *The Messaging software supports only the POP3 and IMAP4 protocols for incoming mail, and SMTP for outgoing mail.*

To set up a mail service:

1. Tap / *E-mail*.
2. Tap *Setup E-mail*.
3. Enter the email address for your account.
4. Enter a password. Select *Save password* if you want the device to remember your password.

5. Tap **Next**.



6. To automatically get connection settings for your email account from the Internet, select the check box.
7. Tap **Next**.
8. Follow the steps in the Setup wizard. If the connection settings are not automatically downloaded from the Internet, you must enter them using the connection details supplied by your ISP or network administrator.

   Note – *You cannot change the account name later.*
9. Tap **Finish**.
10. Tap **OK** to download mail immediately.

Tip – To receive TerraSync™ data files by email, edit the settings for the email account you have set up. To do this, tap **Menu** and then select *Options*. In the *Accounts* tab, tap the email account you want to use to receive TerraSync files. The *Email Setup* wizard appears. Tap **Next** until you reach the last page of the wizard. From the *Message download limit* drop-down list, select ***Entire message***.

When you connect the handheld to the email server, new messages are downloaded to the Messaging folder, messages in the Outbox folder are sent, and messages that have been deleted on the email server are removed from the Messaging folder.

Messages received directly from an email server are linked to the email server rather than an office computer. When you delete a message on the handheld, it is also deleted from the email server the next time you connect the handheld to the email server.

You can work online or offline. When working online, you read and respond to messages while connected to the email server. Messages are sent as soon as you tap **Send**, which saves space on the handheld.

When working offline, you can disconnect from the email server after you download new message headers or partial messages and then decide which messages to download completely. The next time you connect, Messaging downloads the complete messages you have marked for retrieval and sends any messages that you have written.

Connecting to an office computer

Connect the Trimble Geo 5T handheld to an office computer to transfer information, settings, and files from one device to the other, or to install software onto the handheld.

You can connect the handheld to a computer using a Bluetooth wireless link, or using the docking station and a USB cable.

To protect your data, Trimble recommends that you regularly copy important data to an office computer.

Connection management software

To install software onto a Windows Embedded Handheld device, or to copy files between the handheld and a computer, you must connect the device to an office computer. If the computer is running:

- the Windows 7 or Windows Vista operating system, use the Windows Mobile Device Center to manage the connection.
- the Windows XP operating system, use ActiveSync technology to manage the connection.

Note – *You must install the Windows Mobile Device Center or ActiveSync technology onto the computer* ***before*** *you connect the handheld.*

This connection management software also enables you to synchronize office applications on an office computer with the handheld.

CAUTION - The available space on the handheld is small compared to an office computer. To avoid accidentally synchronizing the handheld with a large amount of data on the office computer, Trimble recommends that you either connect to the handheld ***without forming a partnership***, or that you limit the information types and amount of data that is synchronized.

CAUTION - Synchronizing data is designed to keep the same data on both the office computer and the handheld. Exercise care when resynchronizing applications after deleting data from one computer, as resynchronizing will delete the same information from the other computer.

For more information see one of the following:

- Managing the connection using the Windows Mobile Device Center, page 45
- Managing the connection using ActiveSync technology, page 46

Installing the Windows Mobile Device Center

The Windows 7 and Windows Vista operating systems include a basic connectivity driver for Windows Embedded Handheld devices. This driver allows you to transfer files from the handheld to an office computer.

To install software onto a Windows embedded handheld, you must install Windows Mobile Device Center onto an office computer.

To download the latest version from the Microsoft website, go to www.microsoft.com/windowsmobile/devicecenter.mspx.

Installing ActiveSync technology

To download the latest version from the Microsoft website, go to www.microsoft.com/windowsmobile/activesync/default.mspx.

Connecting the handheld to a computer

To connect the Trimble Geo 5T handheld to a computer:

1. Make sure that the handheld and the computer are switched on.
2. Make sure you have installed the appropriate connection management software onto the computer (see Connecting to an office computer, page 44).
3. To form a connection, do one of the following:
   - Use a USB connection:
     a. Place the handheld in the docking station.
     b. Connect the USB data cable to the USB port on the docking station.
     c. Connect the other end of the USB data cable to a USB port on the computer.
   - Use the handheld's integrated Bluetooth radio to establish a wireless serial link to a Bluetooth-enabled computer. For more information, see Connecting to an office computer using Bluetooth wireless technology , page 63
   - Use an RS232 SubD 9-C connection:
     a. Place the handheld in the docking station.
     b. Connect the RS232 SubD 9-C connector to the RS232 SubD 9-C port on the docking station.
     c. Connect the other end of the RS232 SubD 9-C connector to a suitable port on the computer.

When the handheld and the computer are connected, you can manage the connection through a window that appears on the office computer. See one of the following:

- Managing the connection using the Windows Mobile Device Center, page 45
- Managing the connection using ActiveSync technology, page 46

Managing the connection using the Windows Mobile Device Center

1. Connect the handheld to the computer Connecting the handheld to a computer, page 45.
2. If the Autoplay window appears, close the window.
3. The *Windows Mobile Device Center* window displays the message Connected:

Note – *If the connection is not made automatically, check that the connection is enabled in the Windows Mobile Device Center software and on the handheld. For more information, see* *Troubleshooting, page 83**.*

4. Do one of the following:
   - To synchronize files and data between the handheld and a computer, click *Set up your device* and then follow the instructions on screen.
   - To transfer data between the handheld and the computer without synchronizing the devices, click *Connect without setting up your device*.
5. To transfer files between the computer and the handheld, click *File Management*. A Windows Explorer-type window appears, displaying files stored on the handheld. Copy and paste files to other locations on the computer, or from the computer to the handheld.
6. To install software onto the handheld, see Installing software onto the handheld, page 47.
7. To uninstall software from the handheld, click *Programs and Services* and then click *Add/Remove Programs*

Tip – If the *Add/Remove Programs* option does not appear below *Programs and Services*, click *More*. The *Add/Remove Programs* option appears.

For more information, refer to the *Windows Mobile Device Center Help*.

Tip – If the GPS Pathfinder® Office software is installed on the office computer, you can configure the Connection Manager utility in the GPS Pathfinder Office software to automatically detect when you connect a Trimble Geo 5T handheld to the computer. This enables you to automatically transfer data from the TerraSync software, differentially correct the data, and then export it to a GIS. For more information, refer to the *GPS Pathfinder Office Software Help*.

Managing the connection using ActiveSync technology

1. Connect the handheld to the computer (see Connecting the handheld to a computer, page 45). The *Synchronization Setup Wizard* appears:

   Note – *If the connection is not made automatically, check that the connection is enabled in the ActiveSync technology and on the handheld. For more information, see* *Troubleshooting, page 83**.*
2. Do one of the following:
   - To synchronize files and data between the handheld and a computer, click **Next** and then follow the instructions in the *Synchronization Setup Wizard*.
   - To transfer data between the handheld and the computer without synchronizing the devices, click **Cancel** to close the wizard.
3. The *Microsoft ActiveSync* window displays the message Connected:
4. To transfer files between the computer and the handheld, click **Explore**. A Windows Explorer-type window appears, displaying files stored on the handheld. Copy and paste files to other locations on the computer, or from the computer to the handheld.
5. To install software onto the handheld, see Installing software onto the handheld, page 47.

6. To uninstall software from the handheld, select *Add/Remove Programs* from the *Tools* menu. Clear the check box beside the program you want to remove and then click **OK**.

For more information, refer to the *ActiveSync Help*.

Tip – If the GPS Pathfinder Office software is installed on the office computer, you can configure the Connection Manager utility in the GPS Pathfinder Office software to automatically detect when you connect a Trimble Geo 5T handheld to the computer. This enables you to automatically transfer data from the TerraSync software, differentially correct the data, and then export it to a GIS. For more information, refer to the *GPS Pathfinder Office Software Help*.

Installing software onto the handheld

Before you begin, refer to the installation instructions provided with the software.

Some software installations are specifically designed to run on a Windows Embedded Handheld. To install software on a Windows Embedded Handheld device:

1. Connect the handheld to a computer (see page 45).
2. Copy the installation files to a folder on the handheld.
3. Browse to the folder on the handheld. Tap and hold the installation setup file and then select Run.
4. If prompted after installation, reset the handheld (see Resetting the handheld (page 22)).

To install software that is provided on a CD, or as an installation setup that runs on an office computer:

1. Connect the handheld to a computer (see page 45).
2. If the software is provided on a CD, insert the software CD into the office computer.
3. Run the installation setup.
4. If prompted, select the install option for a Windows embedded handheld. Once the software is installed on the computer, it is automatically transferred to the handheld.

   Note – *If a memory card is inserted in the handheld, the card appears as an installation location option. Trimble recommends that you install software to the handheld's storage memory, not to a memory card. If you install software to a card and then remove the card from the handheld, the software will not be available for use.*
5. If prompted after installation, restart the handheld.

Using the integrated radios to connect to other devices

The Trimble Geo 5T handheld includes an integrated Bluetooth radio, and provides a number of options for connecting to networks and other devices. In addition, one model of the Geo 5T handheld includes an integrated cellular modem for sending and receiving data.

To use the Bluetooth radio or the cellular modem, you need to turn it on (see Turning on and turning off the integrated radios below).

Using a data connection from your local cellular provider, the Geo 5T handheld's integrated cellular modem can be used to connect to the Internet to receive real-time corrections from a VRS™ network, send and receive messages (including email, SMS, or instant messages), or to send and receive files and other data to and from the office directly in the field.

You can use Bluetooth wireless technology to connect to the Internet using a cellular phone. You can also connect directly to other Bluetooth-enabled devices such as a laser rangefinder, or a barcode scanner, that are within range (typically within 5 m to 10 m of the handheld).

This section describes how to enable the radios, and the main connectivity options available. Use the table below to identify the wireless connection type you want to make and then follow the steps provided.

Connection method	To...	See...
Geo 5T cellular modem	Connect to a cellular network	page 50
Bluetooth wireless technology	Connect to another Bluetooth-enabled device (paired and non-paired connections)	page 52
	Connect to a Bluetooth-enabled phone for Internet access	page 57
	Connect to a Bluetooth-enabled serial device	page 62
	Connect to an office computer to use ActiveSync technology	page 63
	Beam files to or from another device	page 66
Bluetooth wireless technology, or Geo 5T cellular modem	Access a corporate network through your Internet connection	page 67

Deactivating the integrated radios

The Trimble Geo 5T handheld is shipped with Bluetooth wireless technology activated. You may need to deactivate the Bluetooth radio in the handheld if the country in which you are working does not approve the use of Bluetooth wireless technology. If you are unsure about whether the Trimble Geo 5T handheld's radios are approved for use in your country, check with your Trimble reseller.

Use the Radio Activation Manager software to deactivate the integrated Bluetooth radio, or to reactivate the radio if it has been deactivated. The Radio Activation Manager software runs on an office computer.

The latest copy of the software is available for download from the Trimble website. Go to www.trimble.com/support.shtml, click the link for your receiver type (Geo 5T), click Downloads, and then click Radio Activation Manager.

Turning on and turning off the integrated radios

You can use the Wireless Manager application to turn on and turn off the Trimble Geo 5T handheld's Bluetooth radio or the cellular modem (see Using the Wireless Manager, page 49).

You can also turn on or turn off the Bluetooth radio from within the Bluetooth application (see Turning on and turning off the Bluetooth radio from within the Bluetooth application, page 49).

To make the Trimble Geo 5T handheld visible to other Bluetooth-enabled devices and enable them to connect, see Making the handheld visible (discoverable) to other Bluetooth devices (page 50).

Using the Wireless Manager

You can use the Wireless Manager application to turn on and turn off the Trimble Geo 5T handheld's Bluetooth radio and the cellular modem. You can turn on and turn off any of the radios at the same time, or control each individually.

To open the Wireless Manager, do one of the following:

- Tap the title bar, tap any of the radio icons and then tap **Wireless Manager**.
- Tap / *Settings* / *Connections* / *Wireless Manager*.

Turn on the Bluetooth radio to be able to connect to other devices or networks.

Turn on the cellular modem to be able to send and receive data.

Turn off the Bluetooth radio, and/or cellular modem to prevent the handheld from sending or receiving wireless signals.

Tip – To conserve power, turn off the radios when not in use.

To turn on or turn off the radios using the Wireless Manager

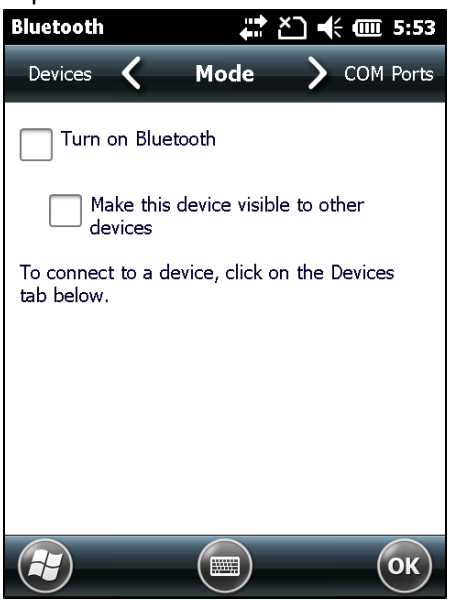
1. Open the Wireless Manager (see above).
2. Do one of the following:
   - Tap **All** at the top of the screen to turn on the radios, or to turn off all the radios if they are already on.
   - Tap **Bluetooth** or **Modem** to turn on the radio that you want to use, or to turn off the radio if it is already on.

   The status fields below the the **Bluetooth** button and the **Modem** button change from *Off* when the radios are turned on and show the current state of the radio. The Bluetooth status field shows *On* or *Visible*, and the **Modem** status field shows *On* or the name of the cellular network that you are connected to.
3. Tap to exit the Wireless Manager.

Turning on and turning off the Bluetooth radio from within the Bluetooth application

1. Tap / *Settings* / *Bluetooth.*
2. Tap the *Mode* tab.

3. Select the *Turn on Bluetooth* check box to turn on the radio, or clear this check box to turn off the radio.
4. Tap **OK**.



Note – *If the integrated Bluetooth radio is deactivated, the message* Problem with Bluetooth hardware *may appear when you try to turn on the Bluetooth radio or discover devices.*

Making the handheld visible (discoverable) to other Bluetooth devices

To allow other Bluetooth-enabled devices to connect to the Trimble Geo 5T handheld, or if the handheld will not connect to or pair with another device you are attempting to connect to, you must make the handheld visible (this is sometimes referred to as “discoverable”).

To make the handheld ***visible*** to other devices:

1. Tap / *Settings* / *Bluetooth.*
2. Tap the *Mode* tab.
3. Select the *Turn on Bluetooth* check box, if it is not already selected. This enables the integrated Bluetooth radio.
4. Select the *Make this device visible to other devices* check box.
5. Tap **OK**.

Connecting to a cellular network from the modem

Use the Geo 5T handheld’s cellular modem to connect to a cellular network and access the Internet or a company network. Use this type of connection to access a background map server, or for Internet and email access.

To connect to a cellular network, you must:

1. Configure the connection to the network.
2. Connect to the cellular network.

Before you begin the steps below, Trimble recommends that you:

- make sure that a SIM card is inserted in the handheld. See Inserting and removing the SIM card.
- confirm that the modem can access the Internet directly. If necessary, contact your service provicer and confirm whether you must enter a user name, password, and domain details when connecting.
- make sure that you have the correct APN (Access Point Name) from your cellular provider.

Step 1: Configure the connection

To set up an automatic configuration:

1. Tap / *Settings* / *Connections* / *Wireless Manager.* If the modem is Off, tap Modem to turn it on. Close the Wireless Manager.
2. Tap / *Settings* / *Connections* / *Connections.*
3. On the *Connections* screen, on the *Tasks* tab, tap *Automatically configure connection*.
4. The device holds a database of the most common cellular providers and the correct connection settings. The handheld will attempt to identify the SIM vendor.
5. If the SIM vendor is recognised correctly, tap **Next** to continue. The connection settings are set up automatically. The process takes about 30 seconds.
6. If the SIM is not automatically detected, or the vendor settings are not known you will need to set up the configuration manually.

To set up a manual configuration:

1. Tap / *Settings* / *Connections* / *Wireless Manager.* If the modem is Off, tap Modem to turn it on.
2. Tap / *Settings* / *Connections* / *Connections.*
3. Under Tasks, tap *Add a new modem connection*.
4. Enter a name for the connection, for example **My Connection.**
5. In the *Select a modem* field, select Cellular Line and then tap **Next**.
6. Enter the APN provided by your cellular provider (check with your provider first for correct settings, some providers have multiple APN settings).
7. Tap **Next**.
8. Enter a username password and domain if required (check with your provider, these are often not required). If not required, leave these fields empty.
9. Tap **Finished**.

Step 2: Connect to the cellular network:

1. Tap / *Settings* / *Connections* / *Wireless Manager.* If the modem is Off, tap Modem to turn it on. Close the Wireless Manager.
2. Tap / *Settings* / *Connections* / *Connections.*
3. Under Tasks, tap *Manage existing connections*. The configured connections are listed.
4. Tap and hold the connection that you want to use. Tap *Connect* from the pop-up menu.
5. The task bar shows the "connecting" icon, for example . When the connection is open/established, the task bar shows the "connected" icon, for example . The icons shown depend on the network—see Status indicators for full details.

Once connected, open an application, for example, Internet Explorer, to test the connection. Some applications automatically launch the connection when you start the application, if a current connection is not already established.

Connecting to a Bluetooth-enabled device

The Trimble Geo 5T handheld has an integrated Bluetooth radio that you can use to establish a wireless connection to other Bluetooth devices that are within range.

Using a Bluetooth connection, you can communicate with devices such as cellular phones, office computers, other handhelds, and Bluetooth-enabled laser rangefinders and barcode scanners. You can also communicate with peripheral devices that use Bluetooth adaptors instead of serial or USB connections.

The Trimble Geo 5T handheld can act as a Bluetooth client device. The concept of client devices is explained in detail below.

Connecting to a Bluetooth device as a client

You can use the Trimble Geo 5T handheld as a ***client*** device, which uses ***services*** offered by Bluetooth host devices that are within range. In general the ***host*** device provides information to the client device, but in some cases the client initiates the connection and also provides information to the host device.

The services used by a Trimble Geo 5T handheld when connecting as a Bluetooth client are:

Service	Description
Dialup Networking (DUN)	Connects the handheld to a cellular phone or modem for dial-up network or Internet access.
Personal Area Networking (PAN)	Connects to Bluetooth network access points or phones that support the Personal Area Network/Network Access (PAN) profile.
Serial Port	Emulates an RS-232 serial (COM) port on the handheld.
ActiveSync	Enables an ActiveSync connection to a computer.
Input Device (HID)	Connects the handheld to a physical input device, such as a keyboard.
Wireless Stereo	Connects to Bluetooth A2DP (Advanced Audio Distribution Profile) headphones.

A client can connect to a number of different services provided by different hosts. The number of active connections at any one time affects the speed of the connections. The diagram below shows the handheld connected to different types of host devices using Bluetooth wireless technology.

1	Bluetooth headset	5	Wireless stereo	9	Input data
2	Cell phone	6	Audio output	10	Serial port
3	Laser rangefinder /barcode scanner	7	Background map	11	ActiveSync
4	Laptop / PC	8	DUN or PAN	12	ActiveSync for file transfer

The dashed arrows indicate the client device—that is, the Trimble Geo 5T handheld—connecting to host devices. The Bluetooth profile (or service) used for the connection is shown between the arrows, for example, the ***DUN*** service is used for a connection to a cell phone, and the ***Serial Port*** service is used for a serial connection to a barcode scanner or laser rangefinder.

The solid arrows indicate the flow of information between devices. For example, when the Trimble Geo 5T handheld connects as a client to:

- a cellphone, the handheld uses the DUN or PAN host service provided by the phone to access the Internet and background map data.
- a laptop computer or office computer, the devices use the ActiveSync service to exchange information to and from either device.

- Bluetooth headphones, the handheld uses the Wireless Stereo host service provided by the headphones to play audio files and system sounds.

Setting up a Bluetooth connection

To use another Bluetooth-enabled device with the Trimble Geo 5T handheld, you must form a Bluetooth connection between the two devices, during which you select the type of service to use for the connection. This defines how the devices will communicate with each other.

After forming the Bluetooth connection between the devices you may need to configure settings for the connection such as the COM port for the field software to use, or the number for the phone to dial. You must then connect to the other device using the appropriate software application.

To connect the Trimble Geo 5T handheld to another Bluetooth-enabled device, you can use either a paired connection or a non-paired connection.

Note – *If you are connecting to a phone, skip this section and go to* *Connecting to a Bluetooth-enabled phone for Internet access on page 57**, where the pairing step is described as part of the procedure for connecting to a phone.*

Trimble recommends using a paired connection, if pairing is supported by the other device, as a paired connection creates a more secure connection and makes reconnecting to the device easier. For more information, see Pairing with a Bluetooth-enabled device below.

Some devices do not support paired connections. Use a non-paired connection if the device does not have a keyboard, and if you know that the device does not automatically exchange a pre-programmed passkey during pairing. For more information, see Setting up a Bluetooth connection to a non-paired device, page 56.

To connect the Trimble Geo 5T handheld to the other device, do one of the following:

- Pair with a Bluetooth-enabled device (see below)
- Set up a connection to a non-paired device (see page 56)

Pairing with a Bluetooth-enabled device

Pairing the handheld with another Bluetooth-enabled device creates a permanent security bond between the devices, which helps to exchange information securely between the devices. The paired relationship is established when two devices create and exchange a link key. Once the relationship is established, the handheld and the other Bluetooth device only need to have their Bluetooth radios turned on to exchange information; they do not need to be visible to other devices.

To pair with a Bluetooth device:

1. Make sure that the handheld and the Bluetooth device you want to pair with are within five meters of each other, and that the Bluetooth radio in each device is turned on.
2. On the Trimble Geo 5T handheld, tap / *Settings* / *Bluetooth*.
3. In the *Devices* tab, tap *Add new device*. The handheld searches for other Bluetooth devices and displays them in the list. If the device you are trying to connect is not displayed in the list,

ensure that the device is on and within range and then tap **Refresh** to search for devices again.

4. Tap the name of the device you want to pair with and then tap **Next**.
5. In the *Passcode* field, enter a passcode of between 1 and 16 characters. If you are connecting to:
   - a device with a keypad, enter a passcode of your choice.
   - a device without a keypad, but you know that the device has a pre-programmed passcode that will be exchanged, enter that passcode on the Trimble Geo 5T handheld.

   Note – *Trimble recommends that you enter only numbers, as some devices do not support passcodes that include letters.*
6. Tap **Next**.
7. When prompted, enter the same passcode on the other device.
8. On the handheld, tap the name of other device. The *Partnership Settings* screen appears.
9. If required, change the name of the device in the *Display Name* field.
10. Select the service(s) you want to use with this device. For example, if you are connecting to:
    - a Bluetooth-enabled phone to connect to the Internet and receive real-time corrections or download background maps, select ***Dialup Networking (DUN)***.
    - a serial device, such as a laser rangefinder, select ***Serial Port***.
    - a computer to access ActiveSync technology (or WMDC), select ***ActiveSync***.

      Note – *Only* ***ActiveSync*** *shows on the Windows embedded handheld. Select* ***ActiveSync*** *even if you use the WMDC on the desktop computer.*

      Note – *For more information on the types of devices that the Trimble Geo 5T handheld can connect to, and the supported Bluetooth services, see* *Connecting to a Bluetooth-enabled device , page 52*
11. Tap **Save**.

12. Tap **OK** to close the Bluetooth application.
13. Tap to close the *Settings* screen.

You have now created a partnership between the Trimble Geo 5T handheld and the other Bluetooth-enabled device so that they can communicate. To start using the connection, you must complete the configuration steps for that type of connection and then connect to the device. For more information, see:

- Connecting to a Bluetooth-enabled phone for Internet access , page 57
- Connecting to a Bluetooth-enabled serial device, page 62
- Connecting to an office computer using Bluetooth wireless technology , page 63

Tip – You only need to pair the handheld with a device before you connect to the device for the ***first*** time.

Setting up a Bluetooth connection to a non-paired device

Setting up a Bluetooth connection to a non-paired device enables you to connect to a device that does not allow you to enter a passcode on the device, or that does not automatically exchange a pre-programmed passkey during pairing.

To set up a non-paired connection to a Bluetooth-enabled device:

1. Make sure that the handheld and the Bluetooth device you want to connect to are within five meters of each other, and that the Bluetooth radio in each device is turned on.
2. Tap / *Settings* / *Bluetooth*.
3. In the *Devices* tab, tap *Add new device*. The handheld searches for other Bluetooth devices and displays them in the list.

4. Tap the name of the device you want to connect to and then tap **Next**. The *Enter Passcode* screen appears.

5. Tap **Next** without entering a passcode.
6. If prompted to add the device to your device list, tap **No**.
7. On the handheld, tap the name of the other device. The *Partnership Settings* screen appears.
8. If required, change the name of the device in the *Display Name* field.
9. Select the service(s) you want to use with this device. For example, if you are connecting to:
   - a Bluetooth-enabled phone to connect to the Internet and receive real-time corrections or download background maps, select ***Dialup Networking (DUN)***.
   - a serial device, such as a laser rangefinder, select ***Serial Port***.
   - a computer to access ActiveSync (or WMDC), select ***ActiveSync***.

     Note – *Only **ActiveSync** shows on the Windows embedded handheld. Select **ActiveSync** even if you use the WMDC on the desktop computer.*

     Note – *For more information on the types of devices that the Trimble Geo 5T handheld can connect to, and the supported Bluetooth services, see* *Connecting to a Bluetooth-enabled device , page 52*
10. Tap **Finish**.
11. Tap **OK** to close the Bluetooth application.
12. Tap to close the *Settings* screen.

You have now created a partnership between the Trimble Geo 5T handheld and the other Bluetooth-enabled device so that they can communicate. To start using the connection, you must complete the configuration steps for that type of connection and then connect to the device. For more information, see:

- Connecting to a Bluetooth-enabled phone for Internet access , page 57
- Connecting to a Bluetooth-enabled serial device, page 62
- Connecting to an office computer using Bluetooth wireless technology , page 63

Connecting to a Bluetooth-enabled phone for Internet access

If your model of Trimble Geo 5T handheld does not contain an integrated cellular modem, you can use the handheld's Bluetooth radio to connect to a Bluetooth-enabled cellular phone and then connect to the Internet. Use this type of connection to access a background map server, or for Internet and email access.

Note – *Some cellular phones support the Bluetooth PAN (Personal Area Networking) service as well as the Bluetooth DUN (Dialup Networking) service. Because DUN connections are more common, this section assumes you are making a dialup network connection with the Bluetooth-enabled phone. For information on setting up a PAN service, see* *Connecting to the Internet through a Bluetooth-enabled phone using the Bluetooth PAN profile, page 61**.*

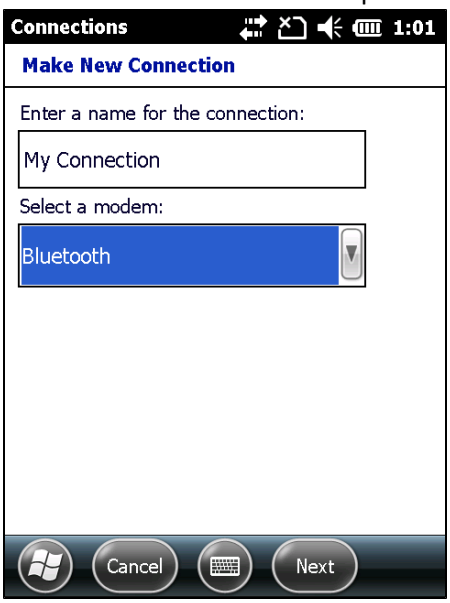
To connect to a Bluetooth-enabled phone using a Bluetooth DUN (Dialup Networking) connection, you must:

1. Connect the Trimble Geo 5T handheld to a Bluetooth-enabled phone and then configure the connection to the dialup network.
2. Connect to the Internet using the dialup network.
3. Configure the software to use the connection. For example, you must configure the GNSS field software to use map data received from the Internet source, or you must set up the Messaging application to send and receive email using the connection.

Note – *Before you begin the steps below, Trimble recommends that you confirm that the phone can access the Internet directly. If necessary, contact the cellular phone provider and confirm whether you must enter a user name, password, and domain details when connecting an external device to the phone using Bluetooth dialup networking.*

Step 1: Connecting the handheld to the phone and configuring the connection to the dialup network

1. Make sure that the handheld and the Bluetooth device you want to connect to are within five meters of each other, and that the Bluetooth radio in each device is turned on. For more information, see Turning on and turning off the integrated radios, page 49.
2. On the handheld, tap / *Settings* / *Connections* / *Connections*.
3. Below ***My ISP***, tap *Add a new modem connection*.
4. Enter the name for the connection. For example, enter the name of the phone or the VRS network that you will connect to.
5. From the *Select a Modem* drop-down list, select ***Bluetooth*** and then tap **Next**.



6. If the phone you want to connect to is:
   - listed, go to Step 7 below.
   - not listed:

a. Tap *Add new device*. The handheld searches for other Bluetooth devices and displays them in the list.

b. If the handheld's integrated Bluetooth radio is turned off, it is now automatically turned on.

c. From the list of available devices, select the device you want to connect to and then tap **Next**.

d. To pair with the phone, enter a passcode of your choice that you will easily remember onto the handheld and then tap **Next**.

e. When prompted by the phone, enter the same password and then accept the connection.

f. On the Trimble Geo 5T handheld, tap *Advanced* to open the Partnership Settings screen. Make sure that ***Dialup Networking (DUN)*** is selected and then tap **Save**.

You have now created a partnership between the Trimble Geo 5T handheld and the phone so that they can communicate.

7. From the *My Connections* list, select the phone that you want to configure the connection to.
8. Enter the GPRS access number for the Internet. Two of the common GPRS access numbers for cellular phones on GSM networks are *99***1# and *99#. If these access numbers do not work, contact the cellular phone provider to obtain the appropriate number to use.

   Note – *You do not need to set up dialling rules or change the Internet connection settings on the phone. The connection settings you enter on the handheld are passed to the phone to use for this connection*
9. Tap **Next**.
10. Unless the phone provider confirmed that you must enter user name, password, and domain settings to access the Internet, tap **Finish** without entering any information in this screen. Otherwise:

    a. Enter the required information.

    b. If the phone provider has told you that you need to change the baud rate or other settings for the connection, tap **Advanced**, configure these settings and then tap **OK**.

    c. Tap **Finish**.

You are returned to the *Connections* screen.

You have now configured the dialup networking connection.

Step 2: Connecting to the Internet using the dialup network

1. On the handheld, go to the *Connections* screen, if it is not already open (tap / *Settings* / *Connections* / *Connections)*.
2. Below ***My ISP***, tap *Manage existing connections.*
3. Tap and hold the connection you want to use and then select *Connect*.

4. Unless the phone provider confirmed that you must enter user name, password, and domain settings to access the Internet, tap **OK** without entering any information in this screen. Otherwise, enter the required information and then tap **OK**.
5. If the phone prompts for confirmation to connect to the Internet, accept the connection.
    - The phone dials the configured GPRS access number and then connects to the Internet.
    - A Connectivity notification appears on the handheld as the connection is being made.
    - After the connection is made you are returned to the *My ISP* screen.
    - To confirm that the Geo 5T handheld is connected to the phone, or to check the status of the connection at any time, tap the title bar and then tap the Connectivity icon on the pull-down list. The notification shows the name of the current connection, and the time elapsed since the connection was made. To hide the notification, tap **Hide**.
6. Tap **OK** to close the *My ISP* screen.
7. Tap **OK** to close the *Connections* / *Tasks* screen.
8. Tap to close the *Connections* screen.

To check the connection status at any time, tap the title bar and then tap the required status icon on the pull-down list.

To end the connection at any time, tap the title bar, tap the required status icon on the pull-down list and then tap **Disconnect**.

To connect to a corporate network or Intranet, see Accessing a corporate network through your Internet connection, page 67.

To send and receive email messages, see Messaging, page 41.

Step 3: Configuring the GNSS field software to use data received from the Internet source

Now that you have connected the Trimble Geo 5T handheld to the Internet, you must configure the software to use the connection to receive data.

To use real-time corrections in Trimble field software, and background map data in the TerraSync software, refer to the Trimble field software documentation on www.trimble.com:

- For the TerraSync software, go to http://www.trimble.com/mappingGIS/TerraSync.aspx?dtID=technical_support
- For the GPS Controller software, go to http://www.trimble.com/support_trl.asp?Nav=Collection-32054

Reconnecting to the Internet

To reconnect to the Internet at any time after setting up the connection, repeat Step 2: Connecting to the Internet using the dialup network.

Connecting to the Internet through a Bluetooth-enabled phone using the Bluetooth PAN profile

This section describes how to set up a Bluetooth Personal Area Network (PAN) connection for Internet access, using Bluetooth-enabled cellular phone.

The PAN service is not available on the Geo 5T handheld model which has an integrated modem.

Making a Bluetooth PAN connection with a Bluetooth-enabled cellular phone is similar to making a Bluetooth Dialup Networking (DUN) connection (see Connecting to a Bluetooth-enabled phone for Internet access , page 57), in that it enables the handheld to access the Internet. If PAN connections are supported by your cellular phone, the advantages of using a PAN connection rather than a DUN connection are:

- PAN connections are easier to set up.
- PAN connections automatically attempt to reconnect when the handheld is resumed from being suspended or shut down.

To access the Internet using a Bluetooth PAN connection to a Bluetooth-enabled cellular phone, you must:

1. Pair the Trimble Geo 5T handheld with a cellular phone that supports the Bluetooth PAN profile.
2. Enable the PAN connection on the handheld.

Step 1: Pairing with the cellular phone

1. Make sure that the handheld and the Bluetooth device you want to pair with are within five meters of each other, and that the Bluetooth radio in each device is turned on.
2. On the Trimble Geo 5T handheld, tap / *Settings* / *Bluetooth*.
3. In the *Devices* tab, tap *Add new device*. The handheld searches for other Bluetooth devices and displays them in the list.
4. If the device you are trying to connect is not displayed in the list, ensure that the device is on and within range and then tap *Refresh* to search for devices again.
5. Tap the name of the device you want to pair with and then tap **Next**.
6. In the *Passcode* field, enter a passcode of your choice (between 1 and 16 characters).
7. Trimble recommends that you enter only numbers, as some devices do not support passcodes that include letters.
8. Tap **Next**.
9. When prompted, enter the same passcode on the other device.
10. On the handheld, the *Partnership Settings* screen appears.
11. If required, change the name of the device in the *Display Name* field.
12. Select the *Network Access Point* check box. The boxes for other services offered by the phone can be unchecked.
13. Tap **Finish**.

Step 2: Enabling the PAN connection

1. In the PAN tab of the Bluetooth application on the handheld, select the cellular phone you just connected to from the drop-down list and then select the *Enable PAN connection* check box.
2. The status field in the PAN tab shows the progress of the connection. Wait until the *Status* field shows Connected.
3. Check the cellular phone and if prompted, allow the connection.
4. The icon in the title bar changes to .
5. Tap **OK** to close the Bluetooth application.
6. Tap to close the *Settings* screen.
7. If the *Establishing Connection* popup message appears on the handheld, select *The Internet (or work via a VPN)* or *Work* and then tap **Connect**, or dismiss the message.
8. Start using the program you want to use, for example Windows Explorer Mobile or Internet Explorer.

To check the connection status at any time, tap the title bar and then on the pull-down list tap the required connection icon. The Bluetooth PAN connection appears as "Network Card".

To end the connection at any time, tap / *Settings* / *Bluetooth*. In the PAN tab, clear the *Enable PAN connection* check box.

Connecting to a Bluetooth-enabled serial device

Use Bluetooth wireless technology to receive data from a Bluetooth-enabled serial device, such as a laser rangefinder.

To connect to a Bluetooth-enabled serial device, you must:

1. Connect to the Bluetooth-enabled serial device.
2. Configure the COM port on the handheld to use for the connection.
3. If necessary, configure the GNSS field software to use data received from the serial device.

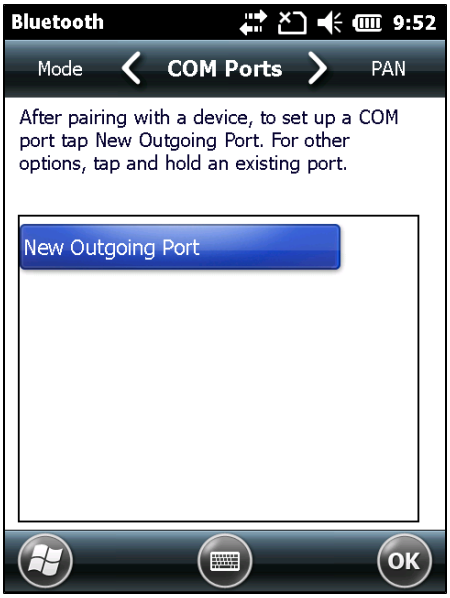
Step 1: Connecting to the Bluetooth-enabled serial device

Connect the handheld to the Bluetooth-enabled device, selecting the ***Serial Port*** service if it is not already selected (see Connecting to a Bluetooth-enabled device , page 52).

Step 2: Configuring the COM port to use on the handheld

1. On the Trimble Geo 5T handheld, tap / *Settings* / *Bluetooth*.
2. Tap the *COM Ports* tab.
3. Tap *New Outgoing Port*.

4. Select the device you want to set up the connection to and then tap **Next**.


Bluetooth
9:52
Mode
COM Ports
PAN
After pairing with a device, to set up a COM port tap New Outgoing Port. For other options, tap and hold an existing port.
New Outgoing Port
OK

5. Select the COM port on the Trimble Geo 5T handheld to use for the connection.
6. The Trimble Geo 5T handheld has five COM ports (COM0, COM1, COM2, COM3, and COM8) available for connections out to Bluetooth-enabled serial devices.
7. Do one of the following:
   - To communicate with any device, for example if you have formed this connection without pairing to a device, clear the *Secure Connection* check box.
   - To communicate only with devices with which the handheld has a Bluetooth partnership, select the *Secure Connection* check box.
8. Tap **Finish**.
9. Tap **OK** to close the Bluetooth application.
10. Tap to close the *Settings* screen.

Step 3: Configuring the GNSS field software to use data from the serial device

Once you configure the connection between the Trimble Geo 5T handheld and the Bluetooth-enabled serial device, you must configure the software to use the connection to receive data.

To use a Bluetooth-enabled external sensor such as a laser rangefinder or a barcode scanner in TerraSync software, refer to the TerraSync software documentation on http://www.trimble.com/mappingGIS/TerraSync.aspx?dtID=technical_support

Connecting to an office computer using Bluetooth wireless technology

Instead of using a USB or serial cable to physically connect to an office computer, you can use Bluetooth wireless technology to connect to ActiveSync technology or the Windows Mobile Device Center on a Bluetooth-enabled office computer.

Note – *Not all Bluetooth devices and Bluetooth management software support ActiveSync connections. Check with the manufacturer of the office computer for compatibility.*

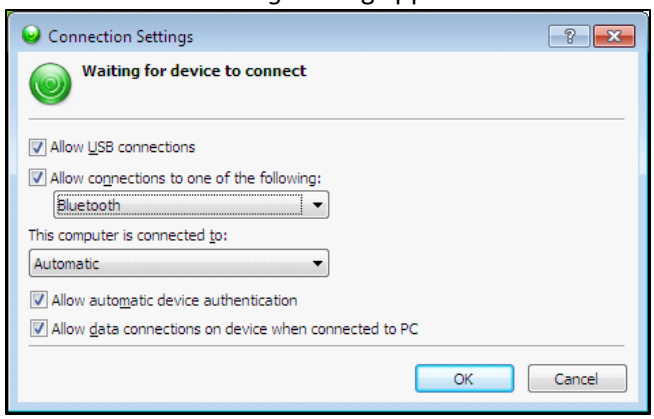
Note – *The exact steps required may vary depending on the office computer.*

To connect to a office computer to use ActiveSync or WMDC with a Bluetooth connection, you must:

1. Set up the connection to the computer.
2. Connect to ActiveSync or WMDC using Bluetooth wireless technology.

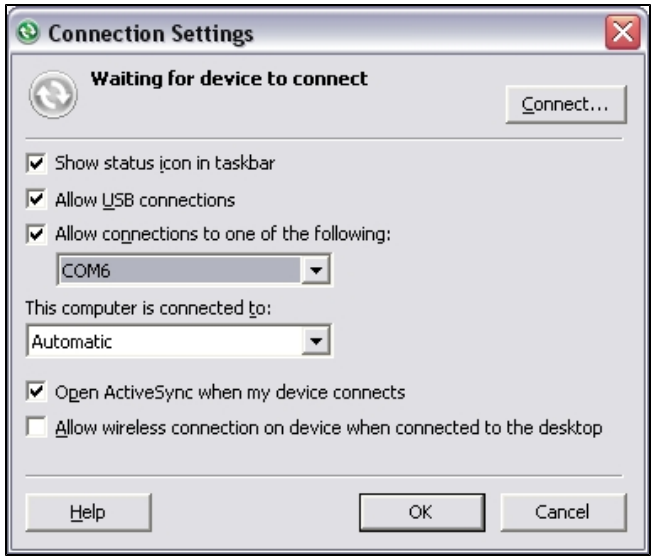
Step 1: Setting up the connection to the computer

1. From the Bluetooth user interface on the office computer, make sure that the computer allows itself to be discovered by other Bluetooth devices.
2. Configure ActiveSync technology or WMDC on the office computer to connect to the correct Bluetooth port. The steps required depend on the operating system installed on the office computer. If the office computer is using:
   - the Windows 7 or Windows Vista operating system:
     a. From the *Start* menu on the office computer, select *Control Panel* / *Windows Mobile Device Center*. If you have previously connected to a device (using USB or another connection method), the Windows Mobile Device Center screen for this device may show. In this case, select Mobile Device Settings. The *Connection Settings* dialog appears:



     b. Select the *Allow connections to one of the following* check box.
     c. From the list, select Bluetooth and then click **OK**.
   - the Windows XP operating system:
     a. From the Bluetooth user interface on the office computer, identify the virtual COM port of the of the host Bluetooth Serial Port or Local Service and ensure that this is enabled. In this example, the virtual COM port is COM5.
     b. Start the ActiveSync technology on the office computer.

c. Select *File* / *Connection Settings*. The *Connection Settings* dialog appears:



d. Select the *Allow connections to one of the following* check box.

e. From the list, select the COM port that you selected in Step a and then click **OK**.

Note – *Before you try to form a Bluetooth connection from the Trimble Geo 5T handheld to the office computer, you must correctly configure the Bluetooth host serial port and ActiveSync technology on the office computer.*

3. On the handheld, tap / *Settings* / *Bluetooth*.
4. In the *Devices* tab, tap *Add new device*. The handheld searches for other Bluetooth devices and displays them in the list.
5. Tap the name of the computer you want to connect to and then tap **Next**.
6. When prompted, enter a passcode of your choice that you will easily remember on the handheld.
7. Enter the same passcode on the office computer.
8. On the handheld, select the ***ActiveSync*** check box in the list of services provided by the computer and then tap **Finish**.
9. The checkbox on the handheld still shows ***ActiveSync***, even if the office computer is running the Windows 7 or Windows Vista operating system and you are using the WMDC.
10. You have now created a partnership between the Trimble Geo 5T handheld and the office computer so that they can communicate.
11. Tap **OK** to close the Bluetooth application.
12. Tap to close the *Settings* screen.
13. To connect, go to Step 2 below.

Note – *The check box on the handheld shows* ***ActiveSync*** *even if the office computer is running the Windows 7 or Windows Vista operating system and you are using the WMDC.*

Step 2: Connecting to ActiveSync using Bluetooth wireless technology

1. On the Trimble Geo 5T handheld, tap / *ActiveSync*.

   Note – *Only* ***ActiveSync*** *shows on the Windows embedded handheld. Select* ***ActiveSync*** *even if you use the WMDC on the desktop computer.*

2. Tap **Menu** and then select *Connect via Bluetooth*.
3. On the Trimble Geo 5T handheld, a message box shows the status of the connection as it is made.
4. When the connection to the office computer is successful, you are returned to the ActiveSync application on the handheld.
5. Tap to close.

The connectivity icon in the status bar shows .

To check the status of the connection, tap the title bar and then tap the connectivity icon on the pull-down list.

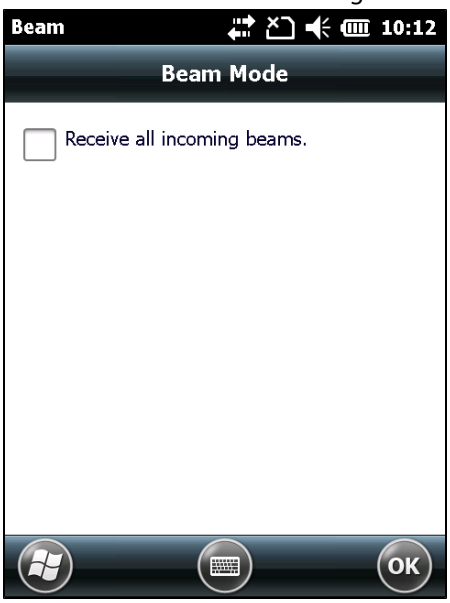
To disconnect, tap / *ActiveSync*on the handheld, and then select *Menu* / *Disconnect*.

Beaming files to or from another device

You can beam files, contacts, tasks, and appointments between the handheld and another device.

To ***receive*** beamed files from another device:

1. Make sure that the Trimble Geo 5T handheld's integrated Bluetooth radio is turned on (see Turning on and turning off the integrated radios, page 49).
2. Tap / *Settings* / *Connections* / *Beam*.
3. Select the *Receive all incoming beams* check box and then tap **OK**.

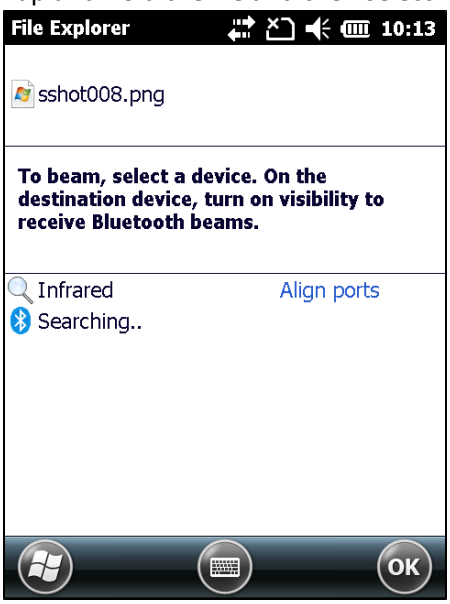


4. When another device attempts to beam a file, you are prompted to accept the file. To receive the file, tap **Yes**.

Note – *All incoming files are automatically saved in the My Documents folder on the handheld.*

To ***send*** beamed files to another device:

1. Make sure that the Trimble Geo 5T handheld's integrated Bluetooth radio is turned on (see Turning on and turning off the integrated radios, page 49).
2. On the Trimble Geo 5T handheld, open File Explorer and go to the file you want to send.
3. Tap and hold the file and then select *Beam File*. The handheld scans for nearby devices.



4. Tap the device you want to send the file to. The file is sent to the device.

A message reports Done or Failed, depending on the outcome of the file transfer.

Accessing a corporate network through your Internet connection

Use a Virtual Private Network (VPN) connection to access a corporate network or Intranet.

Before you begin, obtain the following information from your network administrator:

- username and password
- domain name
- host name or IP address of the VPN server

To access a corporate network through your Internet connection, you must:

1. Set up an Internet connection on the handheld.
2. Set up a VPN connection.
3. Connect to the corporate network or Intranet.

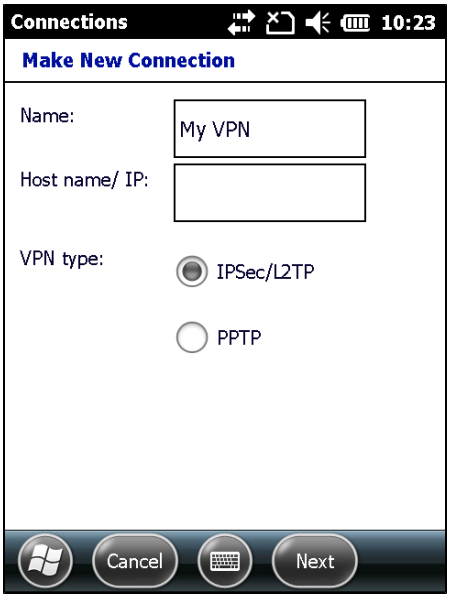
Step 1: Setting up an Internet connection on the handheld

Do one of the following:

- Connect to the Internet using the internal cellular modem. For more information, see page 50.
- Connect to the Internet using a Bluetooth-enabled phone. For more information, see page 57.

Step 2: Setting up a VPN connection

1. On the Trimble Geo 5T handheld, tap / *Settings* / *Connections* / *Connections*.
2. From the *My Work Network* list, tap *Add a new VPN server connection*.
3. Follow the instructions in the *Make New Connection* wizard.



4. Tap **Finish**

Step 3: Connecting to the corporate network or Intranet

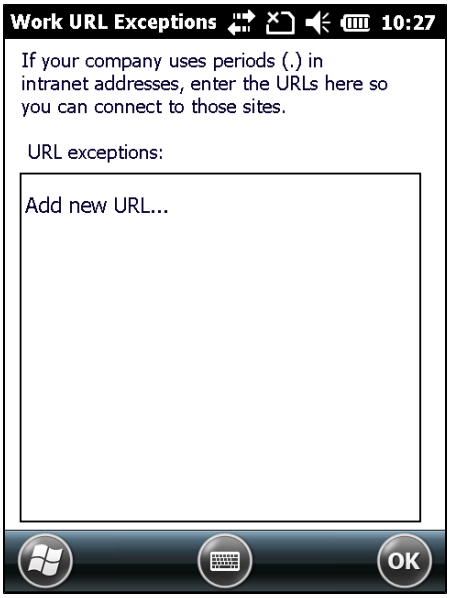
To connect to the corporate network or Intranet, simply start using Internet Explorer.

The Windows Embedded Handheld operating system automatically controls whether the VPN connection is used, depending on whether the URL contains a period. For example, the URL www.trimble.com contains periods, and so the connection to this website is made without using the VPN connection. However, an address to a network computer or file server that does not contain periods automatically starts the VPN connection.

If you need to use the VPN connection to access URL addresses that contain periods, specify exceptions for the addresses that are within the corporate network. To do this:

1. Tap / *Settings* / *Connections* / *Connections*.
2. Tap the *Advanced* tab.

3. Tap **Exceptions**. The *Work URL Exceptions* screen appears.


Work URL Exceptions
10:27
If your company uses periods (.) in intranet addresses, enter the URLs here so you can connect to those sites.
URL exceptions:
Add new URL...
OK

4. Tap *Add new URL*.
5. Enter the URL and then tap **OK**.
6. Repeat Step 4 and Step 5 as required.
7. Tap **OK** to return to the *Advanced* tab of the *Connections* screen.
8. Tap **OK** to close the *Connections* screen.
9. Tap to close the *Settings* screen.

Using the GNSS receiver

The Trimble Geo 5T handheld includes an integrated GNSS receiver that enables you to collect GPS and GLONASS data for incorporating into a GIS or for managing assets.

GPS (Global Positioning System) and GLONASS (GLObal NAvigation Satellite System) are Global Navigation Satellite Systems (GNSS). Each system consists of a constellation of satellites that orbit the earth. GNSS provides worldwide, all-weather, 24-hour time and position information.

To receive signals from GPS or GLONASS satellites, the handheld must have a clear view of the sky. GPS or GLONASS positions may not always be available, particularly in or near buildings, in vehicles, or under tree canopy.

The GNSS receiver will have the best view of the sky when you hold it an angle of approximately 45 degrees (38 ideally) from horizontal, and not too close to your body.

To track GLONASS satellites, you must purchase and install the GLONASS option. You will receive an activation code that you must enter in the GLONASS activation tool. Contact your Trimble reseller for more information.

Supported GNSS field software

For a list of supported software, see the Mapping & GIS Product Compatibility List.

Depending on the GNSS field software you have installed, the default GNSS field software will be GPS Controller, TerraSync, or the Trimble GPScorrect™ extension for Esri ArcPad software.

The GPS Controller software enables you to check the current GNSS status, or to configure the integrated GNSS receiver, and to configure GNSS output settings for third party GNSS applications.

To install the GPS Controller software, go to www.trimble.com/support.shtml. Click GPS Controller and then click Downloads. Click the link for the version you want to install and then follow the instructions in the Installation wizard.

Depending on the GNSS field software you have installed, you can use the software to configure settings such as GNSS, real-time correction, and antenna settings. You may also be able to use the software to connect to a real-time correction source, configure logging settings, and collect features. For more information, refer the documentation for the GNSS field software.

You can also install the GNSS Connector software on aTrimble Geo 5T handheld. Use the software to specify how the integrated GNSS receiver communicates with equipment that is connected to one of the handheld's external communications ports.

To install the GNSS Connector software, go to www.trimble.com/support.shtml. Click *GNSS Connector* and then click *Downloads*. Follow the instructions in the Installation wizard.

Configuring the GNSS field software to connect to the receiver

The first time you use GNSS field software on the handheld, you may need to configure the software to connect to COM3, which is the GNSS port on the handheld.

The integrated GNSS receiver has three COM ports for communicating with software on the handheld and with external devices. Two ports are for outputting GNSS data, and one port is for receiving real-time corrections into the receiver.

GNSS COM ports

To use GNSS, open the appropriate GNSS COM port. The type of communication used for each port is described below:

Port	Function	Description
COM2	NMEA	Outputs NMEA-0183 messages. NMEA is a standard GNSS communication protocol used by many GNSS applications. The handheld outputs the following NMEA messages by default: GGA, GLL, GSA, GSV, RMC, VTG, ZDA. All messages are output at a one-second interval.
COM3	TSIP	Outputs and receives TSIP messages. TSIP (Trimble Standard Interface Protocol) is used by Trimble GNSS applications, and is also supported by some other GNSS applications.
COM4	Real-time corrections	Receives real-time correction messages. If you are using an external correction source connected to COM1 or a Bluetooth port, the corrections must be redirected to COM4. For more information, see Ensuring the accuracy of your GNSS data, page 73.

Connecting to the COM port

Details of how to configure different types of GNSS field software to connect to the GNSS COM port are as follows:

GNSS field software	Configuration details
GPS Controller	Run GPS Controller. The software automatically activates the integrated GNSS receiver on COM3.
TerraSync	Run Terrasync. The software automatically activates the integrated GNSS receiver on COM3.
ArcPad with the GPScorrect extension	When the Trimble GPScorrect extension is installed, the extension automatically configures the ArcPad software to use the integrated GNSS receiver on COM3 using the Trimble GPScorrect protocol. To connect to GNSS, tap the **GPS** button and then tap **Yes**. To configure a real-time DGNSS source, or to view status information, run the GPScorrect extension. To do this, tap the **GPScorrect** button in the Trimble toolbar.
ArcPad without the GPScorrect extension	In ArcPad, tap the **GPS** drop-down menu and then select *GPS Preferences* from the drop-down menu. Tap the *GPS* tab. In the *Protocol* field, select NMEA 0183. In the *Port* field, select COM2. Tap **OK**. Tap the **GPS** button and then tap **Yes**.

GNSS field software	Configuration details
NMEA application	Configure the software to connect to GNSS on COM2 and then use the Connect or Activate GPS command.

For a list of supported software, see the Mapping & GIS Product Compatibility List.

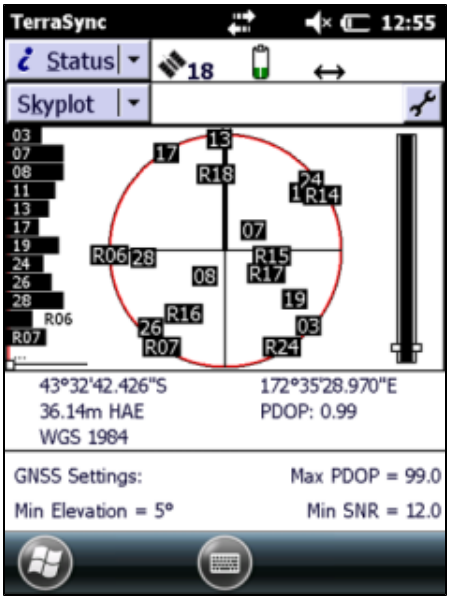
Using the GNSS field software

Tap / *Programs* and then select the GNSS field software, for example *TerraSync*.

When you first open any Trimble GNSS field software, the Skyplot section is displayed.

Viewing available satellites

Use the graphical Skyplot section or the Satellite Info section in the installed Trimble GNSS field software to view detailed GNSS information.



Note – *To receive signals from GNSS satellites, the handheld must have a clear view of the sky. GNSS positions may not always be available, particularly in or near buildings, in vehicles, or under tree canopy.*

Filled (black) boxes represent satellites that the receiver is using to compute its current GNSS position. Unfilled (white) boxes represent satellites that the receiver is getting signals from but is not using because the signals are too weak. In the example shown here, eight satellites are being tracked and seven of these satellites are being used to compute GNSS positions.

Note – *Numbers with no box represent satellites that are available, but that the software is not receiving signals from.*

Note – *If you differentially correct data in real-time for only GPS or only GLONASS (that is, not the full GNSS constellation), the skyplot may still show that all satellites (GPS and GLONASS) are used for computing the position. The receiver will use all satellites but will apply a weighting based on the data quality, with higher priority on the satellites for which real time data are available. For detailed information, tap the real-time correction source icon in the status bar of the software.*

Your current GNSS position is displayed at the bottom of the screen.

Tip – For detailed information on satellite positions and signal strengths, use the Satellite information screen in the Status section.

Resetting the GNSS receiver

Trimble GNSS field applications all have options to reset the receiver to:

- delete the almanac
- delete information stored on the last known position
- restart the receiver
- reset the GNSS receiver to factory default settings

Ensuring the accuracy of your GNSS data

The Trimble Geo 5T handheld has an integrated high-performance GNSS receiver that calculates very accurate GNSS positions. The accuracy that you obtain from the Trimble Geo 5T handheld is affected by a number of factors, including whether the data is differentially corrected in real-time or after data collection, and the availability of GNSS satellites in the sky when you collect the data.

To correct errors in the collected data and to further improve the accuracy of the GNSS positions, use differential GNSS. Differential GNSS (DGNSS) requires one or more additional receivers, called base stations or reference stations, which are located at known points. Data collected at the base stations is used to determine GNSS measurement errors and compute corrections to these errors. These corrections are then applied to data collected in the field either in real time or during postprocessing. For more information, see Differential GNSS explained, page 76.

The list below identifies the most important settings and techniques that you can use in the field to improve the accuracy of your data. This list assumes that you are using Trimble GNSS field software, and lists items in order of most important to less important.

- If you are using the TerraSync software to collect data, use accuracy-based logging. For more information, refer to the TerraSync software Getting Started Guide on http://www.trimble.com/mappingGIS/TerraSync.aspx?dtID=technical_support.
- Use real-time differential corrections. If you have access to dual-frequency corrections from a VRS network, use the corrections from the VRS network.
- Configure the GNSS settings for the receiver to use Smart Settings to increase the precision of your data, and to minimize the effect of atmospheric interference and poor satellite geometry.
- Connect to an external antenna, if you have one.
- Plan GNSS data collection around the times of the day when satellite geometry is best.

Connecting to a real-time differential correction source

Use a real-time differential GNSS (DGNSS) source to give you better accuracy as you collect data. For more information about how real-time differential GNSS works, see Differential GNSS explained, page 76.

Using real-time corrections from an Internet source

DGNSS corrections are often broadcast over the Internet. For example, corrections generated by a VRS network are commonly broadcast over an Internet server. A VRS network uses data from several base stations to provide rover receivers with corrections that are generally more accurate than corrections from a single base station. Alternatively, you can connect to a server that provides DGNSS corrections from a single base station.

For information on how to connect to the Internet and receive real-time corrections from an Internet server, see Connecting to a Bluetooth-enabled device , page 52 or Connecting to a Bluetooth-enabled phone for Internet access , page 57.

Using SBAS corrections

The Trimble Geo 5T handheld has an integrated GNSS receiver that uses Satellite Based Augmentation Systems (SBAS) correction messages to improve the accuracy and integrity of GNSS data.

The SBAS tracking mode is Auto. In Auto mode, the receiver tracks or locks onto the most powerful satellite signal. The GNSS receiver can track two SBAS satellites at the same time in Auto mode. It uses corrections from only one SBAS satellite at a time, but tracking two satellites can improve the availability of SBAS real-time corrections. For example, if you are working in environments where obstacles may block the direct line of sight to the SBAS satellite, there is less chance of signal loss if you are tracking more than one SBAS satellite.The receiver tracks SBAS satellites according to your geographical location:

- Wide Area Augmentation System (WAAS) satellites are tracked in the Continental United States including Alaska, and parts of Canada and Mexico.
- European Geostationary Navigation Overlay Service (EGNOS) satellites are tracked in Europe.
- MTSAT Satellite-based Augmentation System (MSAS) satellites are tracked in Japan.

Note – *If you have other Trimble GNSS field software installed, configure real-time correction settings in that application instead of the GPS Controller software.*

For further information, refer to the Trimble field software documentation on www.trimble.com:

- For the TerraSync software, go to http://www.trimble.com/mappingGIS/TerraSync.aspx?dtID=technical_support
- For the GPS Controller software, go to http://www.trimble.com/support_trl.asp?Nav=Collection-32054

Using real-time corrections from an external correction source

You can improve the accuracy of your data by using real-time corrections from an external correction source, such as a DGNSS radio. Connect the external correction source to a Bluetooth port (Configuring the GNSS field software to connect to the receiver, page 70). Use the GNSS field software to set up and monitor the real-time input source that you want to use.

The integrated GNSS receiver communicates only through its GNSS COM ports (COM2, COM3, and COM4). Trimble GNSS field software, such as TerraSync and GPS Controller, automatically redirects input from an external correction source connected to COM1 or to a Bluetooth port to the real-time GNSS COM port (COM4).

For information on configuring the GNSS field software to use corrections from a VRS network or single base station that transmits corrections over the Internet, see Connecting to a Bluetooth-enabled phone for Internet access , page 57.

For further information on setting up an external correction source, refer to the Trimble field software documentation on www.trimble.com:

- For the TerraSync software, go to http://www.trimble.com/mappingGIS/TerraSync.aspx?dtID=technical_support
- For the GPS Controller software, go to http://www.trimble.com/support_trl.asp?Nav=Collection-32054

Using Smart Settings

Trimble recommends that you use accuracy-based logging and Smart Settings to control the quality of the GNSS positions logged and let the TerraSync software manage the logging of positions based on your required accuracy.

Using Smart Settings, the GNSS receiver generates the best possible position for any given environment, without the need for you to adjust receiver settings to match the conditions. Regardless of whether you are working under canopy, in wide open spaces, or somewhere in between, Smart Settings automatically generates the best solution possible.

Using traditional mask techniques in open conditions, weak signals can accidentally degrade the accuracy of the position if masks are too relaxed, whereas in obstructed conditions, more satellites are needed to help maintain optimum accuracy if masks are set too strictly. Using Smart Settings, the receiver uses all available GNSS information to determine which combination of satellites to use to deliver the best position. Once you set the receiver to use Smart Settings, the receiver does the rest.

By default, the receiver is configured to use Smart Settings. In this mode, the receiver will track all visible satellites, and determine which to use in the position solution to automatically generate the most accurate position possible.

To open the GNSS Settings form in the Trimble GNSS field software, do one of the following:

- Tap **GNSS Settings** in the Setup section.
- Tap in the Skyplot, Satellite Info, or Plan section.

To enable Smart Settings, select the *Use Smart Settings* check box.

To define custom GNSS settings, clear the *Use Smart Settings* check box. Editable fields appear enabling you to specify the required GNSS quality settings.

Planning a data collection session

To maximize productivity, plan GNSS data collection around the times of the day when satellite geometry is best. The TerraSync software and the GPS Controller software both include a Plan

section with an animated skyplot and DOP (satellite geometry) graph for your position for the next 12 hours.

In the Plan section, you can check the planning skyplot as you play a session, then use the timeline to zoom in on times when geometry is poor. As you adjust GNSS settings, the Plan section is updated, so you can see the effect of different quality control settings.

Using an external GNSS antenna

The Trimble Geo 5T handheld provides an external GNSS antenna port, which is suitable for use in most conditions.

CAUTION - The presence of any dust or moisture in the external antenna port may cause the external antenna to not work. To prevent dust or moisture entering the external antenna slot, take care when using the handheld with an external antenna in wet or dusty conditions.

You can connect a Tempest or an external patch antenna for when you work in a vehicle. For improved yield under canopy, you can use a Tempest antenna, or a patch antenna with a ground plane.

Configure antenna settings in the GNSS field software, once you have connected the external antenna to the handheld.

For details on configuring antenna settings in the TerraSync software, refer to the TerraSync software Getting Started Guide on http://www.trimble.com/mappingGIS/TerraSync.aspx?dtID=technical_support.

Differential GNSS explained

Use differential GNSS to correct errors in your collected data. Differential GNSS (DGNSS) requires one or more additional receivers, called ***base stations*** or reference stations, which are located at known points. Data collected at the base stations is used to determine GNSS measurement errors and compute corrections to these errors. An unlimited number of mobile GNSS receivers, called ***rovers***, collect GNSS data at unknown locations within the vicinity of the base station. Errors common at both the base station and the rover receiver are corrected with DGNSS either in real time or during postprocessing.

Real-time DGNSS

In real-time DGNSS, the base station calculates and broadcasts the error for each satellite as each measurement is received, enabling you to apply corrections while in the field and collect accurate GNSS data. DGNSS corrections are available from a variety of public and commercial sources. They can be generated and broadcast in real-time by privately or self-owned GNSS base stations, or by a wide range of government agencies.

Real-time DGNSS corrections can be used on the Trimble Geo 5T handheldfrom Satellite Based Augmentation Systems (SBAS) such as WAAS in the US and EGNOS in Europe. SBAS uses multiple base stations to calculate the DGNSS corrections that are then delivered to the user from a Geostationary satellite.

Factors that affect real-time DGNSS accuracy include how often the corrections are updated, how far you are from the base station, and whether the coordinate system used by the correction source matches the coordinate system used by the GNSS receiver.

Postprocessed DGNSS

In postprocessed DGNSS, the collected GNSS data is transferred to an office computer, and measurements from the base station are downloaded. You can postprocess GNSS data collected with Trimble GNSS field software using:

- the GPS Pathfinder Office software
- the Trimble GPS Analyst™ extension for Esri ArcGIS for Desktop software

Factors that affect the accuracy of postprocessed DGNSS include the type of receiver and antenna used at the base station, the distance between the base station and the location where the rover data was collected, the accuracy of the base station position, and the logging interval at the base station.

For more information, refer to the documentation provided with the postprocessing software.

Postprocessed real-time DGNSS

If you collected data corrected in real time, you do not need to postprocess the data.

However, if your data files contain autonomous (uncorrected) positions as well as real-time corrected positions, Trimble recommends that you postprocess the data. During postprocessing, you can choose whether to correct only autonomous positions, or all positions.

If you collected data with submeter accuracy in real time, Trimble recommends that you postprocess the data, as postprocessed data is usually more accurate than data corrected in real time.

Outputting NMEA data to external equipment

Use the GNSS Connector software to specify how the integrated GNSS receiver communicates with equipment that is connected to one of the handheld's external communications ports.

You must first install the GNSS Connector software.

To open GNSS Connector, tap / GNSS Connector.

The GNSS Connector software lets you connect the NMEA GNSS COM port to COM2 or Bluetooth ports and configure port settings such as the baud rate for COM2.

Use the GNSS Connector software to output NMEA messages from the integrated GNSS receiver to another device, such as an external data collector.

The connections that you create in the GNSS Connector software are active only while the software is running. Connections created by the GNSS Connector end when you exit the software.

For more information, go to www.trimble.com/support.shtml and refer to the GNSS Connector Help. Click GNSS Connector and then click Help.

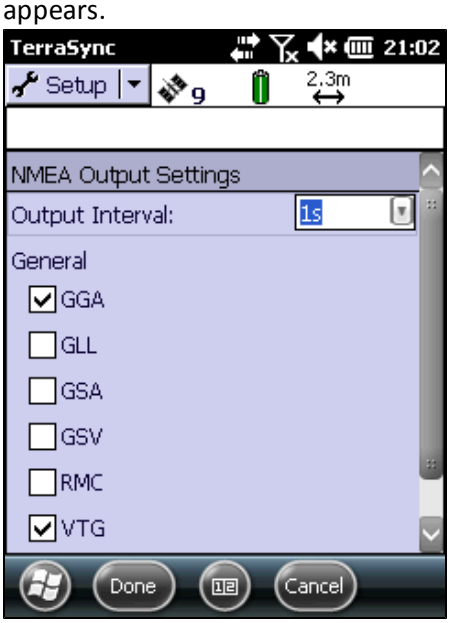
Configuring NMEA output

You can use the Trimble Geo 5T handhelds integrated GNSS receiver with any GNSS field software that accepts NMEA messages.

To configure the NMEA data output settings, use the GPS Controller software. The software is provided free from the Trimble website. For more information, see Using the GNSS receiver, page 70

To configure NMEA data output:

1. In the *GNSS Settings* form, set the *NMEA Output* field to ***On***.
2. Tap the **Setup** button that appears next to the *NMEA Output* field. The *NMEA Output Settings* appears.



3. Configure the NMEA message output settings.

CAUTION - NMEA standard dictates that a baud rate of 38400bps should be used for NMEA messages. Depending on the number of satellites being tracked the amount of data being captured at once may often cause the 38400 bit limit to be exceeded.
Buffers have been added which allow the data to be stored and then sent when it is able to. This avoids data corruption, but may delay delivery of data, and positions may take as long as 8 seconds to be sent from the time at which they were originally recorded.
If you need 38400bps output, Trimble suggests that you try to minimise the effect by reducing the amount of NMEA data being sent, for example, by dropping out NMEA sentences from the NMEA stream.

4. Tap **Done**.

For more information, refer to the *GPS Controller Help*.

Using the camera

The Trimble Geo 5T handheld contains an integrated digital camera, which you can use to capture photos or video.

Starting the camera application

To start the camera, tap /*Pictures & Videos*, then tap *Camera* or the **Camera** soft key.

The camera application is started in Still (Photo) mode.

Using the camera in Still mode

To take a photo:

1. Use the view finder to frame the picture you want to take.

2. When focusing, the focus square on the preview screen changes color:
   - White - attempting to focus
   - Red - cannot focus
   - Green - focus locked
3. When focus is locked, hold the device still, and press and hold the Enter button until you hear the 'click'.
4. Press the **Camera** soft key or **OK** to close the photo.
5. Continue taking photos if required, or press **OK** to close the camera application and return to *Pictures & Videos*.

Changing photo settings

Start the camera application, and then tap **Menu** to access the following options:

Option	Details
Video	Switch from Still to Video mode. See Using the camera in Video mode, page 80
Mode	Select *Normal* to take one photo at a time, *Burst* to take five photos at one-second intervals when you press the Enter button, or *Timer* to take a photo five seconds after you press the Enter button.
Resolution	Set the resolution to determine the quality and size of the photo: QVGA (320 x 240), VGA (6450 x 480), XGA (1280 x 960), QXGA (2048 x 1536)
Full Screen	Select to display the image full screen. Tap the right softkey to exit Full Screen.
Options	See Camera setting options, page 80

Using the camera in Video mode

1. Start the camera, tap **Menu**, and then select *Video*.
2. Press and hold the Enter button to start recording. The counter on the left under the viewfinder shows the duration of the recording. If a 15 or 30 second recording limit is set (see Camera setting options, page 80), this shows on the right under the viewfinder.
3. Press the Enter button to stop recording. If a recording limit is set, the recording stops automatically when the set time has elapsed.
4. Press the Enter button again to record further videos, or press **OK** to close the camera application and return to *Pictures & Videos*.

To play back a video, open it from *Pictures &Videos*. See Managing photos and videos, page 81

Changing video settings

With the camera application in Video mode, tap **Menu** to access the following options:

Option	Details
Still	Switch from Video to Still mode. See Using the camera in Still mode, page 79
Quality	Set to determine the quality and size of the video: 176 x 144, or 320 x 240
Full Screen	Select to display the image full screen. Tap the right softkey to exit Full Screen.
Options	See Camera setting options, page 80

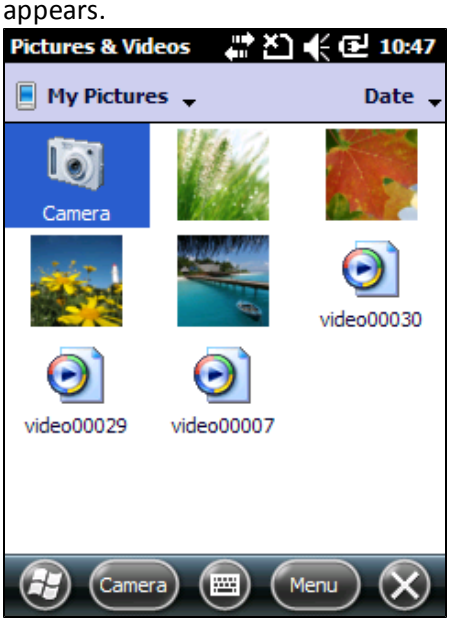
Camera setting options

To access the camera setting options, start the camera application, and then tap **Menu**.

Tab	Options
General	Resize photos for emailing, and specify whether photos rotate (90 degrees) left or right.
Slide Show	Set options for viewing photos as a slide show.
Camera	Specify a filename prefix, storage location, and image compression level.
Video	Turn audio on or off, and set a time limit for video recording.

Managing photos and videos

To view and manage photos and videos, tap /*Pictures & Videos*. The *Pictures &Videos* screen appears.



To rename a photo or video:

1. Tap the required file top open it, tap **Menu**, then scroll down and select *Properties*. Alternatively, make sure the file is selected without opening it, and then tap **Menu**, and select *Tools*/ *Properties*.
2. Enter a name in the *Name* field and tap **OK**.

To delete a photo or video, tap and hold the required file, and then select *Delete* from the pop-up menu.

To copy a photo or video, tap and hold the required file, and then select *Copy* from the pop-up menu.

To send a photo or video using email or SMS, tap and hold the required file, and then select *Send*from the pop-up menu.

To edit a photo:

1. Tap the required file, tap **Menu**, then scroll down and select *Edit*.
2. You can:
   - Tap **Rotate** to rotate the photo 90 degrees clockwise. Tap **Rotate** again if required until the photo has the desired orientation.
   - Tap **Menu**, and then select one of the following:

Option	
Crop	Drag a box around the area of the photo that you want to crop, and then tap inside the box to crop the photo.
Auto Correct	Auto correct the photo.
Undo	Undo the last action.
Revert to Saved	Reject any changes you have made since the last Save.
Save As...	Save the file with a new name.

Troubleshooting

Use this section to identify and solve common problems that may occur when using the Geo 5T handheld. Please read this section before you contact technical support.

Power issues

Problem	Cause	Solution
The handheld does not turn on.	The battery is flat	Recharge or swap the battery. See Charging the battery inside the handheld (page 19) or Charging a battery outside of the handheld (page 20).
The screen is blank.	The handheld is turned off.	Press the Power button to turn on the handheld.
	The handheld has locked up.	Reset the handheld (see Resetting the handheld (page 22)).
The handheld is not charging.	The internal temperature has risen above the allowed maximum (40 °C or 104 °F) for charging the battery.	Do one or all of the following: • Turn off the integrated radios before charging the handheld. • Suspend the handheld before charging. • Remove the handheld from any external heat sources (for example, sunlight). The handheld will automatically start charging again when the internal temperature has dropped below the range for charging the battery.
The battery power percentage bar does not appear in the Power control.	The battery has 0% power.	Recharge the battery (see Powering the handheld (page 17)). Once the battery level is above 0%, the battery power percentage bar reappears. Tap *Start* / *Settings* / *System* / *Power* / *Battery* to view the level of power remaining in the battery.
Under some circumstances the AC adapter may be faintly audible at close proximity.	The AC adapter is a highly efficient Energy Star V adapter which is required to operate at very low audible duty cycles when unloaded so as not to waste energy	There is no safety issue related to the faint noise. In the event of a disconcerting noise, disconnect the mains adapter from the mains as soon as a battery charge is complete.
The charge level of the battery drops when the handheld is turned off.	The handheld was left in Suspend mode or was left fully charged for a long duration.	Before storing the handheld, completely shut down the handheld (see Turning on and turning off the handheld (page 21)). Then store the handheld as recommended (see Storing the handheld, page 14).

Problem	Cause	Solution
	The handheld was left in suspend mode with a wireless radio turned on.	Before suspending the handheld, use the Wireless Manager to turn off all wireless radios. Make sure that all the radios are turned off after suspending the handheld. If a radio is still active,the Wireless LED will flash once every four seconds.

Backlight issues

Problem	Cause	Solution
The backlight does not come on when you tap the screen or press a button.	The backlight is not set to turn on in the Backlight control.	Tap *Start* / *Settings* / *System* / *Backlight* to view the Backlight control, and make sure that the *Turn on backlight when a button is pressed or the screen is tapped* check box is selected. Tap *Start* / *Settings* / *System* / *Brightness*to view the Brightness control, and make sure that the brightness is not set to Dark (slider positioned far left).
The screen is blank or hard to see.	The backlight is off.	Tap the screen or press a button.
	The backlight level needs to be adjusted.	Tap *Start* / *Settings* / *System* / *Brightness*to view the Brightness control and then adjust the slider.

Touch screen issues

Problem	Cause	Solution
The touch screen does not respond to finger or stylus taps.	The touch screen is incorrectly aligned.	Realign the screen. See Screen, page 39
	The touch screen is locked.	To unlock the touch screen, slide the Unlock icon.
	The handheld has locked up.	Reset the handheld. See Resetting the handheld, page 22.
The screen is blank.	The handheld is turned off.	Press the Power button to turn on the handheld.
	The battery is flat.	Recharge or swap the battery. See Charging the battery inside the handheld (page 19) or Charging a battery outside of the handheld (page 20).

Problem	Cause	Solution
	The handheld has locked up.	Reset the handheld. See Resetting the handheld, page 22.
The screen is hard to see.	The brightness level needs to be adjusted.	Open the Brightness control and then adjust the brightness level (see Backlight, page 40).
	The backlight is off.	Tap the screen to turn on the backlight.
	You are unable to see parts of an application windows when the screen is in landscape orientation.	Some applications are designed for portrait orientation only.To view the entire application window, change the screen display to portrait. See Screen, page 39
	The selected display theme does not have enough contrast.	Select the High-Contrast display theme. Tap *Start* / *Settings* / *Personal* / *Home*, select the High-Contrast theme and then tap **OK**.

Storage card issues

Problem	Cause	Solution
The handheld does not recognize a storage card.	The handheld does not support SDIO (SD input/output) cards.	Use an SD or SDHC card.
Files on the storage card are not visible or are not able to be opened.	Files have been encrypted on another device and have a .menc file extension.	Remove encryption from the files. See Encrypting files on memory cards, page 24.

Keypad issues

Problem	Cause	Solution
Pressing the application key does not activate the function shown on the tile above it.	The hardware application key has been programmed to run another program or to perform another action.	Do one of the following: • Tap the touch screen tile to activate the function shown on the tile. • Re-program the application key to perform the same action as the touch screen tile. To do this, tap *Start* / *Settings* / *Personal* / *Buttons*, select the button to reprogram and then select <Left Softkey> or <Right Softkey>.

Connection issues

Network connections

Problem	Cause	Solution
The connection with the cellular phone suddenly ends.	If you change the proxy settings of the handheld while connected to a cellular phone, the cellular phone ends the connection.	Make any changes to proxy settings before connecting to a mobile device.
Unable to connect to another Geo 5T handheld.	Data encryption settings are set incorrectly.	When setting up a peer-to-peer ad-hoc network with a WEP encryption, set a Network Key, rather than leaving the key blank to be provided automatically.

Windows Mobile Device Center

Problem	Cause	Solution
Windows Mobile Device Center will not connect to the handheld.	The connection is not initiated automatically.	In the Windows Mobile Device Center software on the office computer, select *Mobile Device Settings* / *Connection Settings*.
	The Windows Mobile Device Center software does not recognize the Geo 5T handheld.	Restart the office computer. Disconnect the handheld from the office computer, reset it (see Resetting the handheld, page 22) and then reconnect it to the office computer.
	The connection is not enabled in Windows Mobile Device Center on the computer.	In the Windows Mobile Device Center software on the office computer, click *Mobile Device Settings* / *Connection Settings*. If you are using: • a USB cable, make sure that the *Allow USB connection* check box is selected from the drop-down list. • a Bluetooth connection, make sure that the correct port for Bluetooth is selected. Then open the Bluetooth control on the handheld. In the *Devices* tab, tap the partnership and in the services list make sure that the *ActiveSync* check box is selected.
	The connection is not enabled on the handheld.	On the handheld, tap *Start* / *ActiveSync* / *Menu* / *Connections*. Make sure that the *Synchronize all PCs using this connection* check box is selected, and that the correct option is selected.

Problem	Cause	Solution
	The handheld connection settings conflict with network settings or VPN client software.	If you are using a USB cable, use the USB to PC utility to change the connection method the handheld uses to connect to the Windows Mobile Device Center on the computer. Tap *Start*/ *Settings* / *Connections* / *USB to PC Utility*. Clear the *Enable advanced network functionality* check box. The handheld stops using the default RNDIS method to connect to the Windows Mobile Device Center.

ActiveSync technology

Problem	Cause	Solution
ActiveSync technology will not connect to the handheld.	The connection is not initiated automatically.	In the ActiveSync technology dialog on the office computer, select *File*/ *Connection Settings*and then tap **Connect**.
	The ActiveSync technology does not recognize the Geo 5T handheld.	Disconnect the handheld from the office computer. Restart the office computer. Reset it (see Resetting the handheld, page 22) and then reconnect it to the office computer.
	An incompatible version of ActiveSync technology is installed.	ActiveSync version 4.5 and later is compatible with the Geo 5T handheld. If version 4.5 or later of the ActiveSync software is not installed on the office computer, you can download the latest version from the Microsoft website at www.microsoft.com/windowsmobile/activesync/default.mspx
	The connection is not enabled in ActiveSync on the computer.	In the ActiveSync technology dialog on the office computer, click *File* / *Connection Settings*. If you are using: • a USB cable, make sure that the *Allow USB connection* check box is selected from the drop-down list. • a Bluetooth connection, make sure that the correct port for Bluetooth is selected. Then open the Bluetooth control on the handheld. In the *Devices* tab, tap the partnership and in the services list make sure that the *ActiveSync* check box is selected.
	The connection is not enabled in ActiveSync on the handheld.	On the handheld, tap *Start* / *ActiveSync* / *Menu* / *Connections*. Make sure that the *Synchronize all PCs using this connection* check box is selected, and that the correct option is selected.
	The handheld connection settings conflict with network settings or VPN client software.	If you are using a USB cable, use the USB to PC utility to change the connection method the handheld uses to connect to ActiveSync technology on the computer. Tap *Start*/ *Settings* / *Connections* / *USB to PC Utility*. Clear the *Enable advanced network functionality* check box. The handheld stops using the default RNDIS method to connect to the ActiveSync technology.

Bluetooth wireless technology

Problem	Cause	Solution
The handheld cannot discover a nearby Bluetooth device.	The integrated Bluetooth radio is not activated.	The handheld's Bluetooth radio has been deactivated. If Bluetooth wireless technology is allowed where you are working, use the Radio Activation Manager software to re-activate the radio (see Radio use, page 7).
	The device is out of range.	Move the devices closer to each other and then scan again.
	Bluetooth wireless technology is not enabled on one or both devices.	Make sure that the Bluetooth radio is turned on, on both the handheld (see Turning on and turning off the Bluetooth radio from within the Bluetooth application, page 49) and the other Bluetooth device.
	The device has not been made Discoverable.	Make sure that the Bluetooth device has been made Discoverable.
The COM port that you assigned to a serial port service is not available in your application.	The application cannot recognize ports if they are added after the application opens.	Exit from the application, add the port and then run the application again.
The Bluetooth connection fails while in use.	The Bluetooth device has moved out of range.	Move the devices closer to each other. The devices should reconnect automatically. If they do not, select the Bluetooth device in the *Devices* tab. Tap and hold the device name and then select *Delete*. Tap *New* to discover the device again.
	The Bluetooth radio has lost the connection.	Turn off the Bluetooth radio on the handheld and then turn on the Bluetooth radio (see Turning on and turning off the Bluetooth radio from within the Bluetooth application, page 49) .
	Bluetooth file transfer interrupts the connection.	When you transfer large image or data files, other Bluetooth connections may stop responding.To avoid problems, close other Bluetooth connections before transferring large files.
An error message reports "Problem with Bluetooth Hardware".	The integrated Bluetooth radio may have been deactivated.	Use the Radio Activation Manager to reactivate the Bluetooth radio. See Radio use, page 7

Internal cellular modem connections

Problem	Cause	Solution
Can't download data.	Your account has no remaining credit.	Contact your cellular provider to ensure that your account has sufficient credit.
Can't connect.	The phone is turned off.	Turn on the phone using the Wireless Manager.
	The connection is incorrectly configured.	Check your APN and connection settings with your provider.
	Cellular service is unavailable.	Check that the phone is within range of receiving strong enough signals to connect. Move to a location with stronger cellular reception. Check with your cellular provider that coverage is available in your region.
Can't set up a connection.	SIM card is missing.	Insert SIM card.
	SIM card is locked.	Check the PIN security: tap *Start* / *Settings* / *Personal* / *Phone*, and select the *Security* tab.
	3G/GSM selection is incorrect for your cellular provider.	Check your settings: tap *Start* / *Settings* / *Personal* / *Phone*, and select the *3G* tab. Set the 3G/GSM Selection to Auto.

GNSS receiver issues

Problem	Cause	Solution
The handheld is not receiving GNSS positions.	The integrated GNSS receiver is not activated.	Use the Connect or Activate GNSS/GPS command in the field software to open the GNSS COM port and activate the integrated GNSS receiver. For more information, see Using the GNSS receiver, page 70.
	Incorrect configuration of serial COM port.	When supplying GNSS data to an external device using the COM1 USB to serial converter cable, set the baud rate to the high-speed TSIP setting: 38400, 8, 1, Odd.
	The GNSS COM port is already in use. Only one application at a time can have the port open.	Do the following: • Exit the software that is using the GNSS COM port and then retry in your application. • Check that a GNSS application is not running in the background. Tap *Start* / *Task Manager* and then select and close (click **End Task**) any GNSS

Problem	Cause	Solution
		applications you are not using. • Make sure that connections are not left in use by the GNSS Connector software; close the application when you are not using the connections.
	The GNSS field software is using the wrong GNSS COM port.	Connect to COM2 if the GNSS field software uses NMEA messages, or COM3 for TSIP messages. For information on which protocol to use, check the documentation for the application.
	Not enough satellites are visible.	Move to a location where the receiver has a clear view of the sky and ensure the antenna is not obstructed. Alternatively, adjust the GNSS settings to increase productivity. For more information, refer to the Help provided with the GNSS field software. If you are using Trimble field software, use smart settings. See Using Smart Settings, page 75.
	The DOP (Dilution of Precision) value for the current position is above the maximum DOP setting.	Wait until the DOP value falls below the maximum DOP specified. Alternatively, adjust the GNSS settings to increase productivity. For more information, refer to the Help provided with the GNSS field software. If you are using Trimble field software, use smart settings. See Using Smart Settings, page 75.
	Wait for real-time is selected in the GNSS field software and the integrated receiver is waiting to receive real-time corrections.	If you are collecting data for postprocessing, clear the wait for real-time selection. Check that the real-time correction source is set up correctly (see Connecting to a real-time differential correction source, page 74).
	External antenna connected but not receiving data.	The handheld can take up to two seconds to detect that an external antenna has been connected or disconnected.
NMEA data includes autonomous positions.	The integrated GNSS receiver outputs autonomous positions when real-time corrections are unavailable.	Configure the NMEA application to filter out non-DGNSS positions.
The GNSS Connector utility reports “Unknown”.	The GNSS Connector software may report “Unknown” on COM3.	This should not interfere with operation of the handheld.

Problem	Cause	Solution
Error Code 5 appears.	A receiver timeout error has occurred, caused by issues with communications to the receiver, or when the receiver has taken too long to reconnect.	Close the dialog and if the handheld does not automatically connect to the receiver, try to connect to the receiver again. If repeated attempts to connect to the receiver fail, contact your Trimble reseller.
The receiver will not connect.	There is a GNSS receiver connection error.	Reset the receiver, then attempt to connect again. If repeated attempts to connect to the receiver fail, contact your Trimble reseller.

Real-time DGNSS issues

Problem	Cause	Solution
The handheld is not receiving SBAS real-time corrections.	The SBAS satellite is obstructed from view.	Check the location of the SBAS satellite in the Skyplot section of the GNSS field software, and if possible move to a different location.
	You are outside the WAAS, EGNOS, or MSAS coverage area.	Wide Area Augmentation System (WAAS) satellites are tracked in the Continental United States including Alaska, and in southern parts of Canada. European Geostationary Navigation Overlay Service (EGNOS) satellites are tracked in Europe. MTSAT Satellite-based Augmentation System (MSAS) satellites are tracked in Japan. If you have selected satellites that are not available at your location, you cannot use SBAS corrections.
The handheld is not able to track a new or a specific SBAS satellite.	You are not using the latest SBAS configuration (.ini) file.	1. To download the software, go to www.trimble.com/support.shtml, and navigate to your receiver type. Under the *Downloads*folder, click SBAS.INI. 2. To specify the satellites you want the receiver to track or to ignore, select the Custom option in the *Tracking Mode* field in the *Integrated SBAS Settings* form of the Trimble GNSS field software.
The handheld is not receiving real-time corrections from the external real-	There is no physical connection to the external source.	Connect the external real-time correction source to COM1 using the optional USB to serial converter, or to a Bluetooth port on the handheld.

Problem	Cause	Solution
time correction source.		
	There is no Bluetooth wireless connection to the external source.	The Bluetooth external correction source is more than ten meters from the handheld, or is obstructed. Move the devices closer together, in a direct line of sight, to re-connect.
	The external source is incorrectly connected to the real-time COM port.	In the *Real-time Settings* section of the GNSS field software, select the COM port that the real-time source is connected to.
	The port settings are incorrect.	Change the port settings to match those used by the external source.
	No GNSS positions are available.	You cannot use real-time corrections until the GNSS receiver is computing positions. In the GNSS field software, make sure that the integrated GNSS receiver is activated, enough satellites are available, and that the satellite geometry (PDOP) is good enough to compute positions.
	Integrated SBAS is selected as the second choice source of real-time corrections.	If the SBAS status is Waiting, the integrated GNSS receiver may incorrectly change the status of the preferred real-time choice to Waiting as well. To avoid this, select Wait for real-time or Use uncorrected GNSS as your second choice.

Recommended GNSS settings for maximum precision and productivity

Problem	Cause	Solution
Satellite shadow	Satellite shadow is when the line of sight between the GNSS receiver and satellites is partially or fully blocked by obstructions such as buildings, trees, or land masses. The effect of satellite shadow is a reduction in the number of satellites that the receiver is able to track. In general, the quality of your data increases with the number of satellites being used to calculate the position.	Tracking more satellites can help to improve satellite geometry and thereby improve accuracy. Ensure the integrated GNSS receiver gets a clear view of the sky as possible. Keep your body mass as far from the receiver as practical and do not crowd over the handheld. Use an external antenna if needed to elevate the position of the antenna.
Multipath	Multipath is when GNSS satellite signals are reflected off nearby objects, such as buildings or cars, causing an erroneous signal to be received by the GNSS antenna. This can cause errors of several meters.	To reduce multipath, where possible collect data in an open environment away from large reflective surfaces and with a clear view of the sky.

Problem	Cause	Solution
Weak satellite signal	Signal-to-Noise Ratio (SNR) is a measure of the strength of the satellite signal relative to the background noise. GNSS quality degrades as the signal strength decreases. Weak signals may be caused by signals coming through vegetation, multipath signals, or low satellite elevation.	Use smart settings with Trimble field software to allow the receiver to determine maximum precision positions regardless of available satellite signal strength. See Using Smart Settings, page 75.
Poor satellite geometry	Dilution of Precision (DOP) is a measure of the quality of GNSS positions, based on the spread (geometry) of the satellites in the sky that are used to compute the positions. When satellites are widely spaced relative to each other, the DOP value is lower, and in general position accuracy is greater. If the view of the sky is partially affected by satellite shadow, or if all of the satellites are in one area of the sky, the geometry and DOP may be poor.	Use smart settings with Trimble field software to allow the receiver to determine maximum precision positions regardless of available satellite geometry. See Using Smart Settings, page 75.
Satellite elevation	When a satellite is low on the horizon, satellite signals must travel farther through the atmosphere. This results in a lower signal strength and delayed reception by the GNSS receiver, which can cause errors in calculating the position.	Use smart settings with Trimble field software to allow the receiver to determine maximum precision positions regardless of available satellite elevation. See Using Smart Settings, page 75.
Occupation time at a point	Occupation time is the time spent at a point logging GNSS positions.	For point features, remain at the feature and log a number of GNSS positions to obtain an averaged position. When collecting line and area features, collect them using averaged vertices.